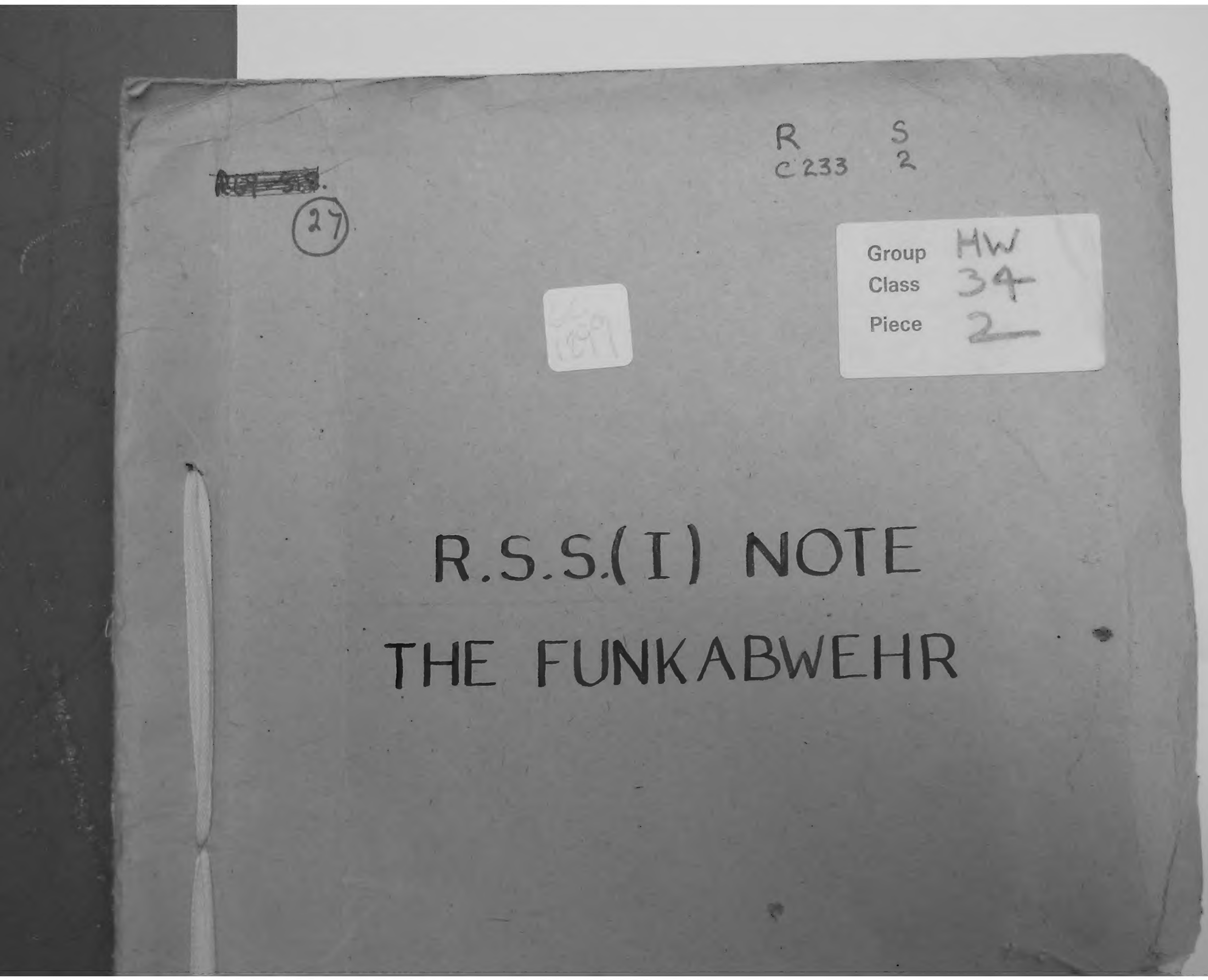

R
C 233
S
2
(27)
1699
Group HW
Class 34
Piece 2
R.S.S.(I) NOTE
THE FUNKABWEHR

TOP SECRET

R.S.S.(I) NOTE

THE FUNKABWEHR

An account of the OKW/WFSt/WNV/FU III and of the Funkabwehrdienst of the Ordnungspolizei.

(NOTE. The word Funkabwehr is used in this report to cover both the organisations discussed. It appears to have been generally used in this sense in Germany, though some sources restricted it to the WNV/FU III in distinction to the Orpo Service.)

Distribution

Internal

1. Controller.
2. Deputy Controller.
3. O.i/c Discrimination
4. " " (circulation)
5. O.i/c Operations Group.
6. " " (circulation)
7. O.i/c Engineering Group.
8. O.i/c M.U. Group.
9. O.i/c V.I. Group.
10. O.C. Nordet, S.C.U.4.
11. O.C. Idet, S.C.U.4.
12. O.C. Mers, S.C.U.4.
13. R.S.S.(I) File.
14. " "

External

15. C.S.C.
16. Director, G.C. & C.S.
17. D.D./C.
18. Mr. C.L.S. Williams.
19. Section V.
20. Section VIII.
21. Section IX.
22. M.I.5 (Mr.Robertson)
23. M.I.5 (Mr.Hughes)
24. M.I.5 (Lt.Col.Sclater).
25. Director, C.I.War Room.
26.
27.
28.
29.
30.

R.S.S.(I)/26
February, 1946.

CONTENTS.

		Page.
Sources.		
A.	INTRODUCTION.	4
B.	STATUS AND LIAISON.	
1.	WNV/FU III.	6
2.	The Orpo Funkabwehrdienst.	6
3.	Cryptography.	7
4.	Intelligence.	8
C.	ORGANISATION.	
1.	Historical Survey.	8
2.	H.Q. and Aussenstellen.	11
3.	The Intercept Companies.	14
4.	Orpo Units.	16
5.	Subsidiary Sources: the Services, Amateurs.	18
6.	Air Co-operation.	19
7.	Communications.	20
D.	ACTIVITIES IN NEUTRAL COUNTRIES.	
1.	Spain.	21
2.	Turkey.	22
3.	Operation Donar.	22
E.	OPERATIONAL METHODS.	
1.	Interception.	23
2.	Discrimination.	24
3.	Cryptography.	26
4.	D/F.	27
5.	Mobile Units.	28
6.	Playbacks.	31
F.	CONCLUSION.	31
APPENDIX I.	Status of the WNV/FU III.	34
II.	Organisation of WNV/FU III.	35
III.	Organisation of Funkabwehrdienst.	36
IV.	Addresses.	37
V.	Covernames.	37
VI.	Personnel.	38.
VII.	Equipment.	44

SOURCES

A large number of interrogation and other reports concerning German counter espionage activities have contained small items of interest pertaining to the Funkabwehr. These have been drawn upon as sources but are too numerous and generally unimportant to list by name.

In general, knowledge of the Funkabwehr is defective as a result of the paucity of reported arrests of its more important personnel. The principal sources used are as follows:-

CSDIC/CMF/SD	22	Interrogation of Oberstlt. Steinberg.
" " SD	80	Interrogation of Gef.Lenz & Gef.Kurfess
" " SD	18	First Interrogation of O/Gef.Schwarze and O/Gef.Demski.
" " SD	32	Second " " "
" /UK/SIR	1106	Interrogation of Uffz. Miersmann.
" " "	1106	Supplement.
" " "	1704	Interrogation of Uffz. Herzfeld.
" " "	1719	Interrogation of Oberstlt. Reile.
" " "	1726	Interrogation of Oberstlt. Mettig.
S.I.M.E.		First Interrogation of O/Gef. Max.
		Second " " "

Statement by Gef.Niesz and Gef. Schiefhacken.

P.W.I.S. (Norway)/39. Interrogation of Rev.Lt.d.Sch. Lust.

Statement by Rev.Lt.d.Sch. Lust.

P.W.I.S.(H)/KP/694 Interrogation of Gef. Weigel.

Statement by Richard Novotny, Josef Hockauf & Alexander Grachegg

W.O.Report on "Experience of long-wave and ground-wave D/F in Norway.

Camp.020	Interrogation of Uffz. Huntemann.
" "	Interrogation of Bleicher.
" "	Interrogation of Oberstlt. Reile.

Miscellaneous captured documents and papers.

Reports by the Engineering section of R.S.S. on captured equipment.

THE FUNKABWEHR

An account of the OKW/WFSt/WNV/FU III and of the Funkabwehrdienst of the Ordnungspolizei.

A. INTRODUCTION

The organisations discussed in this report correspond more or less exactly to the British R.S.S. Comparisons between the wireless security services of the two countries should properly start with an analysis of their respective functions, since differences of structure and method may arise as a result of functional divergencies.

Initially both organisations were established with one primary object: the discovery and location of illicit wireless stations in the territory of or occupied by the respective countries. While this remained throughout a primary function of both, during the course of the war the proportions of the problem presented by illicit wireless developed along quite different lines in German-occupied and Allied-occupied territory. The German security services were faced in all areas for which they were responsible with an immense and ever increasing number of clandestine W/T stations with the result that the whole resources of the Funkabwehr were continuously employed in attempting to eliminate them: generally speaking interception by the Funkabwehr was simply the first necessary stage in the process designed to culminate in mobile unit action and the arrest of an agent, though the Germans did, of course, in appropriate cases employ the technique of refraining from arrest but monitoring an agent's traffic providing this could be read. On the other hand, the number of enemy clandestine stations in Allied-occupied territory remained surprisingly small throughout the war, while at the same time R.S.S. uncovered large networks of clandestine W/T communications controlled by the German I.S. but almost exclusively confined to neutral or German-occupied countries. While retaining its security function, therefore, R.S.S. developed a commitment of pure monitoring which in fact occupied almost the whole of its resources. The Funkabwehr remained throughout a primarily defensive weapon; R.S.S. began with and retained a defensive function but it also developed an equally great offensive role.

In addition to this functional difference between the two organisations there were differences of circumstance which called forth divergencies of method. These are for the most part sufficiently obvious and consist of factors such as the difference in size of the respective areas to be covered and the difficulties of communications which afflicted the Funkabwehr in common with many other German agencies. There was also an important structural difference in that whereas R.S.S. was a single centralised organisation the Funkabwehr suffered from the strange dichotomy, the division between the Wehrmacht and the Nazi Party, which permeated and undermined most aspects of the German war effort. The WNV/FU III avoided passing under the total control of the R.S.H.A., though there were tendencies in that direction towards the end of the war; but it did have the difficult task of directing side by side the work of its own Wehrmacht units and of the Funkabwehrdienst of the Orpo, which came under the ultimate control of Himmler's police machine. After initial subordination to WNV/FU III the Funkabwehrdienst later achieved independence of all but operational guidance and this division within the body of

the Funkabwehr, together with the rivalry and distrust as between the two parts of that organisation and other C.E. authorities, imposed difficulties and strains with which R.S.S. did not have to contend.

Comparisons as to the organisation and methods between the Funkabwehr and R.S.S. will be made in the conclusion of this report. Some attempt will also be made to estimate the efficiency of the Funkabwehr. In this respect certain reports dealing with the methods used and results obtained by the Funkabwehr which reached this country from various sources during the war are of considerable interest. Most of these dealt with France and particularly the Paris area, but there were suggestions that the conditions described were no more than typical of the whole area covered by the Funkabwehr. The claims made in these reports both as to the size and equipment of the organisation and as to the speed with which decisive results were obtained were remarkable. A central station of 300 banks at Paris and stations at Brest, Augsberg and Nuremberg each of 150 banks were reported to be engaged in general search for new local clandestine transmissions and to be equipped with a visual "automatic watch by means of an oscilloscope," in effect an elaborate system of ether-scanners each studying a band of 100 kilocycles. Within a period of two minutes each new suspect signal was observed and reported by line to a large scale system of D/F networks which could obtain bearings with an error of less than half a degree and so plot the position of any station to an area within a radius variously estimated at from 4 to 10 kilometres. This process required a further seven minutes, after which five further minutes were necessary to bring a very strong mobile unit organisation into action and for them to proceed by short-range D/F and shifting to locate the transmitter. "If therefore the transmitter was in a town where there was a mobile unit base its exact location would take place in less than a quarter of an hour, and in any case a station transmitting for the first time could be located within half an hour of its first signal, provided all went well." The last phrase indicates some element of doubt and other reports extended the total time necessary to complete the operation to an hour and a half. Even so the figures given suggested the existence of a wireless security organisation of unexampled resources and efficiency.

The greater amount and reliability of information which has become available since the end of the war has shown that the picture presented by these reports was very far from accurate. In point of fact there is no real evidence that the size of the Funkabwehr was in any way remarkable nor that it possessed greater technical efficiency than might have been expected. This throws an interesting light on the origin of these reports which came from apparently quite distinct sources but were yet mutually confirmatory. In the light of this it is impossible to avoid the conclusion that they were the result of exaggerated information deliberately put out by the German authorities to discourage the Allies from the use of illicit wireless. In this case they may in effect have been a form of preventive weapons used by the Funkabwehr itself whose effectiveness may have been feared by its own chiefs or by other security services to be very different from what these reports suggested.

B. STATUS AND LIAISON

1) WNV/FU/III

The OKW/WFSt/WNV/FU III was the principal German organ dealing with signals security, the interception of clandestine traffic and the location by technical means of agent's transmitters. The WNV/FU formed the wireless department of the signals directorate of the OKW. This (the WNV = Wehrmachts Nachrichten Verbinden) contained departments dealing with administration (Z), line communications (KFA), production (GBN) and ciphers (CHI) as well as wireless (FU). Its head was responsible to the C. of S, OKW. The WNV/FU was responsible for the W/T communications of the OKW (Section Ia), the distribution of ciphers (Ia[1]) and of call-signs, frequency bands, etc. (Ib), the provision of equipment (II) and security (III).

As a department of the OKW the WNV was theoretically in a position to issue directions through its chief to the signals organisations of each of the services. In the case of the Navy and the Luftwaffe this power was practically ineffective. In the case of the Army there was closer co-ordination since the chief of the WNV combined this post with that of chief of the army signals service or HNW (Heeres Nachrichten Wesen). It was thus possible for reasonably close liaison to be maintained between the WNV/FU III and the army Y service. The Y service provided the bulk of the personnel for the WNV/FU III and also did a certain amount of operational work on behalf of this organisation in the case of agent transmitters in the operational areas. The division of responsibility between the Y service and WNV/FU III in respect of traffic of partisans and saboteurs was not clearly defined, but in general the Y service carried out such duties in operational areas.

2) The Orpo Funkabwehrdienst

While the Y service had its own specific tasks of a different nature from those of WNV/FU III and co-operation and overlapping between them were purely incidental, the duties of WNV/FU III and of the Funkabwehrdienst of the Ordnungspolizei were identical. Both were concerned with the location and apprehension of clandestine transmitters and, at least from the outbreak of war, it was impossible to distinguish between clandestine activities directed against the government and the regime, the sphere of the police, and those directed against the state, the sphere in the realm of W/T, of WNV/FU III. At the outbreak of war the police monitoring units, while separately administered, were controlled operationally by the central discrimination department of the WNV/FU III. This unity at the centre, the result of a specific order of the Fuehrer, was not, however, accompanied by co-operation at the outstations. There was for instance in Paris, from the time of its occupation, both an Aussenleitstelle of WNV/FU and a Funkmessstelle of the Orpo; yet there appears to have been practically no contact between the two units while the members of one had but the haziest knowledge of the activities of the other. Similarly while Aussenstellen of WNV/FU co-operated closely with Abwehr III, the latter had no contact with the Funkmessstellen whose liaison was restricted to the Sipo.

During the year 1943 the Orpo established complete independence of the control of the OKW and this resulted in a fairly strict geographical division of responsibility

between the intercept services of the police and those of the OKW. WNV/FU III assumed responsibility for northern France, Belgium and southern Holland, Italy, the Balkans and part of the eastern front: the Orpo retained control in southern France, Holland, Norway, Germany and parts of the eastern front. A distinct central discrimination and control centre was at the same time set up by the Orpo in Berlin-Spandau, the chief of which was responsible to the C.S.O., Orpo, and from then on the theoretical independence of the two organisations was complete. Co-ordination was maintained by a Joint Signals Board in Berlin, under the chairmanship of the Chef WNV, which dealt with matters of general organisation. It would appear that in practice, however, reasonably close liaison was maintained between the two headquarters; it was at least sufficiently close for a common block of numbers to be retained in referring to commitments, for, although such numbers were nominally issued by the Joint Signals Board, in practice they must have emanated from WNV/FU III.

3) Cryptography

The cryptographic organisation which might logically have been expected to have handled the material provided by the WNV/FU was its sister organisation the WNV/CHI. This department was primarily concerned with the provision of ciphers for the OKW and the deciphering of political and diplomatic material; for the latter purpose it controlled its own long-range intercept stations. It did not, however, have any special section set aside for clandestine traffic and, during the first two years of the war, although it received material intercepted by WNV/FU, this appears to have received scant attention and results were negligible. This state of affairs led the officers of WNV/FU both to press the claims of their work with WNV/CHI with a view to the establishment of a special section in this department to handle agent ciphers and also to look around for cryptographic assistance from other quarters. Their requests were rejected by the OKW/CHI on the grounds of shortage of man-power but they succeeded in gaining the interest and co-operation of Inspectorate 7/VI of the army. This was the military cryptographic department responsible for the provision of ciphers for the army and for the deciphering of the product of the army Y services. In the spring of 1942 however, a new special section was set up as Referat 12 in In 7/VI to handle agent traffic. This development coincided with the posting to In 7/VI of Obltn.Dr.Vauck, a cryptographer of great ability, who became head of the new Referat 12 and appears to have directed its activities with considerable success.

From this time on Referat 12 worked in close contact with WNV/FU III and handled all the traffic intercepted by this organisation. It also assisted in the cracking of call sign systems and code procedure. Some contact appears still to have taken place with OKW/CHI but this was of a purely consultative nature and it was Referat 12 which did the day to day cryptographic work of WNV/FU III. This theoretically anomalous position was rectified at the end of 1943 when WNV/FU III moved to Jueterbog, Referat 12 being transferred to the same location. At the same time Referat 12 was detached from In 7/VI and incorporated in WNV/CHI as Referat X. This change was little more than nominal and in no way effected the work of Referat 12 or its contact with WNV/FU III.

4) Intelligence

The normal channels of contact for intelligence and executive operations were, in the case of WNV/FU III, Abwehr III and the GFP, and, in the case of the Orpo units, the SD and the Gestapo. This liaison appears to have worked sufficiently well for normal operational purposes. The commander of Abwehr Leitstelle III West has stated that relations between his units and the local units of the WNV/FU III were always very close and that valuable assistance had been given and received by both sides; but the degree of cordiality and confidence involved, varied considerably with personalities and in many cases mutual distrust between offices prevented all but the most formal and essential collaboration.

This distrust and rivalry showed itself in its most acute forms in cases where it became necessary for WNV/FU III to co-operate with the Sipo or for the Orpo to co-operate with the Abwehr. Jealousy and suspicion were often extreme in such cases, both sides tending to restrict the sphere of the other to the minimum, to claim the credit for success and to shift the blame for failure. The BdS Holland refused to receive a liaison officer from WNV/FU III, regarding the suggestion as an attempt to place a spy in his organisation, and in almost every account a similar ill feeling and distrust appears. It was not until April, 1944 that representatives of Aussenleitstelle West gained admittance to interrogations at SD H.Q. Paris. At the same time it seems that in most areas the necessary minimum of liaison was maintained. In the handling of the Nordpol affair in Holland co-operation between Abwehr III and police intercept units was reasonably satisfactory, while an Abwehr detachment accompanied the SD/Orpo mobile unit operation, Donar, into the unoccupied zone of France in August, 1942.

The purposes for which such collaboration was necessary were the exchange of C.E. Intelligence, the handling of arrests and interrogations of W/T agents located by the Funkabwehr and the running of double agents. These things were for the most part handled locally and it was therefore between the peripheral field units of the various organisations that co-operation was most important. It was also naturally here that it was most varied. Liaison at the centre for the most part consisted of little more than the transmission of reports between departments, though some large-scale cases, such as the Rote Kapelle, appear to have been centrally controlled by co-operation between different organisations.

C. ORGANISATION

1) Historical Survey

At the outbreak of the war the technical resources of the Funkabwehr appear to have consisted of no more than a few small fixed intercept stations and mobile short-range D/F units. These were for the most part Orpo units as were the available long-range D/F stations, though military and naval D/F stations also assisted in security tasks. This organisation was quite insufficient to deal with the increased responsibilities resulting from the early German victories and the increase in the area of occupied territory; at the same time the number of Allied W/T agents in occupied areas was constantly growing.

To meet this situation after the campaign in the West in 1940 companies were taken from the army Y service, reorganised and re-equipped for security intercept work and placed under the control of WNV/FU III. They continued to carry their former Y intercept company numbers. Five such companies were formed in all, two being created in early 1942 from the German Air Force intercept service to cover the Balkans. These Funküberwachungs Companies formed the principal operational resources of the Funkabwehr. They were disposed geographically as follows:-

612 Intercept Coy	Poland and Russia. One platoon maintained in France, one in Denmark.
615 Intercept Coy.	Norway and Western Europe.
616 Intercept Coy.	North France, Belgium, South Holland.
1 (GAF) Special Intercept Coy.	Northern Balkans and Italy.
2 (GAF) Special Intercept Coy.	Southern and eastern Balkans.

Operational control of the intercept companies was exercised by Aussenstellen of WNV/FU. It should be observed that these Aussenstellen represented WNV/FU as a whole and were therefore responsible for the maintenance of the OKW W/T communications and other duties of the organisation as well as for intercept matters. They contained, however a FU III staff, known apparently as the Uberwachungsstab, which dealt with Funkabwehr questions. The Aussenstellen acted as the link between the H.Q. at Berlin and the Intercept Companies and directed the activities of the latter; they were also responsible for local discrimination and cryptography and for liaison with other organisations, though to some extent these functions were further decentralised onto the field units.

Aussenstellen were located at Paris, Lyons, Brussels and Oslo in the West; and at Vienna, Warsaw, Rome, Prague, Athens, Belgrade, Bratislava, Klagenfurt and Varna in the East and South East. They were set up at various times; Aussenleitstelle West at Paris was established in 1940, Aussenstelle Brussels not until September 1943. The stations at Paris and Vienna held the status of Leitstellen with a somewhat shadowy control over the other Aussenstellen in their respective zones. In a number of cases the locations of the Aussenstellen were moved in conformity with the withdrawal of the German armed forces.

Executive command of the Intercept Companies was exercised by an Offizier für Funkabwehr West-Europa in the Western theatre and by an Offizier für Funkabwehr Ost-Europa on the Eastern front. There does not appear to have been an equivalent post in connection with the GAF Intercept Companies of WNV/FU III in the Balkans and in Italy, and these units probably came under the control of the Offizier Funkabwehr Ost-Europa. The Aussenstellen were quite independent of the Offiziere für Funkabwehr although they exercised operational control over the Intercept Companies which were commanded by the latter. The Offiziere für Funkabwehr were in fact headquarters administrative officers dealing with the administration and supply of the Companies, while the Aussenstellen acted as independent staffs for intelligence and liaison and to some extent for discrimination and cryptography, receiving intelligence from the intercept units and issuing commitments to them, but not holding executive control over them.

The final reorganisation took place during the summer of 1944. The prospect of the Allied invasion in the West and the fluid position on the other fronts made all static intelligence units in potentially operational areas unsuitable for con-

ditions they were likely to encounter. To meet this situation the forward units of the Abwehr were rendered mobile and closely attached and subordinated to the operational commands of the fighting forces while retaining their own channels of communication to their central headquarters offices. An exactly parallel development took place in the case of the Funkabwehr. The Aussenleitstellen at Paris and Vienna were reorganised on a mobile basis and becam respectively Funküberwachungsabteilung I (West) and II (South-east). Aussen telle Warsaw was similarly converted into Funküberwachungs abt. III (East). Each Funküberwachungs abt.was directly subordinated to the Hoherer Nachrichtenfuerer (C.S.O.) of their respective commands, but in all other respects their status and functions remained unchanged. The remaining Aussenstellen were similarly reorganised on a mobile basis as Verbindungsorganen but otherwise continued to carry out their former duties. The status and duties of the Offiziere für Funkabwehr do not appear to have been changed by this reorganisation.

In the autumn of 1944 all intercept companies of the WNV/FU III were organised into a regiment as the Uberwachungs Regt.OKW, under command of Major von Bary, the Gruppenleiter and executive chief of WNV/FU III. This change was exactly parallel to the formation slightly earlier of the Nachrichten Regt.506 under Major Poretschkin to include the whole of the signals staff of the Mil.Amt. Both were purely administrative changes and the command, deployment and duties of the intercept companies was in no way affected.

The intercept organisation of the Orpo developed along lines similar to those taken by units directly controlled by WNV/FU III. At the outbreak of war the Orpo controlled six small intercept and four D/F stations in the Reich. This organisation was expanded rapidly with the increase of German occupied territory. The first Orpo intercept unit moved into Norway in May, 1940, and into Holland shortly afterwards; expansion into France, Poland and Russia followed later. These first units were extremely small; that which went into Norway consisted initially of three men only, while in November, 1941 the Orpo station in Holland consisted of no more than four intercept banks; but expansion was fairly rapid and by 1943 each Orpo intercept Company approximated in size to the Intercept Companies of the OKW. Three companies existed by this time covering respectively France and Holland, Norway and the eastern front. The Orpo Companies were known as Polizei Funkaufklärungskompanien.

For administration and discipline Orpo intercept units came under the local C.S.O. of the Orpo. Operationally they were controlled by the evaluation centre of WNV/FU III at Berlin, though the Police Radio Control Centre at Berlin, an office in the Police Technical School, appears to have acted as a post between WNV/FU III and the Orpo units; doubtless by this means the principle was maintained that Orpo units received orders only through their own hierarchy. The part played by the Aussenstellen of WNV/FU III in the work of the Orpo companies varied considerably from place to place. In Norway the Oslo Aussenstelle played an active role; it received all reports of the Orpo company and arranged co-operation for it from the fighting services; while relations do not appear to have been too happy Norway should nevertheless be considered the one area in which something approaching a single joint intercept service under police predominence was established. On both the western and the eastern fronts however, the Orpo units operated quite independently of the Aussenstellen, while in the eastern theatre they maintained close contact in dealing with partisan traffic with KNA 6, the local army Y command.

The main reorganisation of the Orpo Intercept service took place during 1943. The post office work of the Radio Control Centre at Berlin was expanded into an independent discrimination and control centre known as Funkmessleitstelle Berlin.

This nevertheless continued to co-operate closely with the WNV/FU III and, through the latter, with the cryptographers of Referat Vauck. At the same time the headquarters of the companies in France, Norway and Russia were organised respectively into Funkmessstelle West, Funkmessstelle Nord and Funkmessstelle Ost. The headquarters of the intercept units in Holland were sometimes referred to as Funkmessstelle Driebergen, but this was not its real status and it was nominally subordinate to Funkmessstelle West, though in practice it exercised considerable independence. The Funkmessstellen controlled the intercept companies and acted as forward discrimination and liaison staffs. They thus performed for the Orpo intercept units almost exactly the same function as the Aussenstellen did for the Intercept Companies of the OKW, except that the Funkmessstellen were in direct command of their subordinate units and there was not in the Orpo organisation any equivalent of the Offiziere für Funkabwehr in WNV/FU III.

2) <u>H.Q. and Aussenstellen.</u>

Unfortunately the information available allows only a very rough picture to be drawn of the organisation and functions of the headquarters of WNV/FU.III. It appears to have had two primary roles; executive and administrative control of the subordinate intercept units and discrimination of their results and of those of the Orpo Funkabwehrdienst. A third function was the central representation of the security intercept service vis-a-vis other departments, of which the cryptographic sections were by far the most important. The execution of these duties gave to the central headquarters of the WNV/FU III theoretically complete operational control over the whole of the service, but in practice this was to a considerable extent modified on the one hand by the jealously guarded independence of the Orpo service and on the other by the deliberate devolution of the functions of the central headquarters on to the Aussenstellen.

As in most departments of the German operational war effort, a fairly rigorous division was made between the eastern and the western theatres of war. Thus under the Gruppenleiter, Major von Bary, there were separate administrative and discrimination sections for both the east and the west. A parallel division was maintained in the cryptographic work of the Referat Vauck.

The administrative and executive control of the intercept units in their respective zones was the responsibility of the two Offiziere für Funkabwehr, who were directly responsible to the Gruppenleiter. Their offices and staffs were at the central headquarters, but they themselves spent a considerable portion of their time visiting the units for which they were responsible. Their main duties consisted in the provision of personnel and equipment for the companies. FU/III had no equipment depot or workshops of its own, all equipment being drawn from FU/II which formed the central body for the provision of equipment to all departments of WNV/FU. For this purpose the Offiziere für Funkabwehr presumably maintained contact with this department.

The Offiziere für Funkabwehr do not appear to have had any responsibility for the central Auswertung or discrimination section or for the Aussenstellen, though they presumably maintained fairly close contact with the officers in charge of these. (The relation between the Offiziere für Funkabwehr and the chief of the Auswertung is considered to have been somewhat analogous to that between, respectively, the O i/c Operations and the O.i/c Discrimination in R.S.S., i.e. they were quite independent of one another but worked in close co-operation to co-ordinate the activities of their respective spheres).

The Auswertung had a single chief but was organised into east and west sections. These were responsible for the central discrimination of all signals and traffic forwarded by the Aussenstellen, the intercept units and the Orpo Funkmessleitstelle. This work included the allotment of numbers to transmissions covered, allocation of tasks and control of the fixed D/F network for which a separate section existed. Central records and case histories of all commitments were maintained and the Auswertung passed all traffic received to the appropriate section of Referat Vauck. This department was housed close to WNV/FU III and co-operation between the two staffs appears to have been intimate. Referat Vauck gave considerable assistance in analysing changing callsign and QRX systems and similar coded W/T procedures. Details of all authorised German W/T communications other than those of the army were passed to the Auswertung for discrimination purposes.

The H.Q. of WNV/FU III was often referred to as Arbeitstab Bary after the Gruppenleiter. Covernames were often but by no means invariably employed in communications referring to the H.Q. or its subordinate units. Covernames were also used by personnel in neutral countries and by the more important members of the headquarters staff, such as Major von Bary. The latter's correct title was Kommandeur der Funküberwachung, OKW. In the autumn of 1943 the headquarters moved to Dorf Einna, near Jueterbog, about 40 miles south of Berlin. The final movements of the department are somewhat confused. It appears to have been transferred to Halle at the beginning of 1945 and later to south Germany. There are reports of the remnants under Major von Wedel being at Ravensburg on Lake Constance in March. Throughout all these moves FU/III was accompanied by the cryptographers of Referat Vauck, both as In/7/VI Ref.12 and as WNV/CHI/X.

In considering the Aussenstellen it should be remembered that they represented WNV/FU as a whole and that it was only the Uberwachungstaben which were primarily concerned with intercept work. The proportion which this represented of the work of the Aussenstellen varied from case to case, though by the time that the Funküberwachungs abteilungen were created they appear to have been almost exclusively engaged in these duties. FU/III provided the personnel for the intercept work at the Aussenstellen, but otherwise it had no responsibility for the administration of the latter which came for this purpose under WNV/FU/I.

The Aussenstellen carried out locally for the intercept units in their areas the discrimination and allocation duties which were performed centrally by the Auswertung at headquarters. This policy of devolution of functions to the Aussenstellen appears to have been deliberately undertaken to avoid the loss of time involved in handling all material at Berlin. A second advantage was that the personnel of the Aussenstellen could gain a far clearer and more detailed understanding of the local C.E. position and so were better placed to co-ordinate the work of the intercept units with Abwehr III and the other security services in their areas. The allotment of numbers to commitments remained throughout a function of the central office which received traffic and W/T I material from the Aussenstellen and to some extent direct from the intercept companies, and kept records and case histories which were presumably more or less duplicates of those compiled at the Aussenstellen. Task allocation appears to have been carried out by both the Aussenstellen and headquarters, though the former naturally tended to predominate in all operations against local agents. It was in directing the activities of the Funkabwehr machinery in conformity with the requirements of the local C.E. authorities that the principal function of the Aussenstellen was to be found.

A further devolutionary step was taken during the winter of 1942/3 when cryptographers from Referat 12 began to

be attached to the Aussenstellen of WNV/FU III. Previously all traffic had been forwarded by a roundabout route from intercept unit through Aussenstellen and headquarters Auswertung to Referat 12. In the case of traffic that was being currently read this imposed great delays when decodes might be locally of immediate operational value. To counter this, cryptographers were first sent to Aussenstelle Paris to "unbutton" such traffic on the spot, and the same policy was shortly afterwards adopted in the case of other Aussenstellen. One or two cryptographers were usually sent to each Aussenstelle and remained there for a period of two months, when they were replaced. They dealt only with the traffic that had already been broken and in all other cases the raw material continued to be sent direct to Berlin. Relations between the cryptographers and the regular staff of the Aussenstellen do not always appear to have been happy and in Paris the O.C. of the Aussenleitstelle attempted to train some members of his own staff in cryptography in order to take over these duties. Nevertheless, the system remained unaltered until the end.

Aussenleitstelle Paris contained a local staff of about fifteen including a technical officer and a discriminator with two assistant clerks. In addition the special staff of Auswertung Ursula dealing with VHF material (see below) was attached from the end of 1943. A liaison officer was attached to Leitstelle III West, and N.C.O.s partly drawn from the intercept companies were attached to some of its subordinate units. The Aussenleitstelle, now Funküberwachungsabt. I, left Paris in early August, 1944, for Idaroberstein and moved shortly afterwards to Gobelnroth near Giessen where it remained.

The majority of the other Aussenstelle were similarly organised though only that at Oslo contained any special staff concerned with VHF. Aussenstelle Athens was merged in Aussenleitstelle Süd-Ost at Vienna in mid-1943. Aussenstelle Sued at Lyons appears to have been slightly abnoraml. The staff of the Aussenstelle proper totalled three, including the O.C. and one cryptographer from Referat Vauck, though there was probably a small intercept station attached and under its immediate control. It was set up in April, 1943 to combat the resistance movement in southern France and was at first known as Soderkommando A.S. (Armee secrete). It was essentially a mobile unit and visited numerous places in southern France, principally Marseilles and Lyons, until it finally settled down in the latter town. It appears to have carried out most of the normal functions of an Aussenstelle and was primarily concerned with advising the C.E. authorities in running playbacks.

Personnel for both the headquarters and the Aussenstellen of WNV/FU III were for the most part drawn from a special training depot for linguist signallers which supplied any special needs for this type of personnel of the OKW and Army Signals services. The staff of Referat Vauck was mainly drawn from the same source. This depot started as the 9th (Dolmetscher) Company of the Herresnachrichtenschule at Halle. In early 1941 the whole school moved to Leipzig where it was attached to the II Nachrichten Lehrregiment and at the same time the 9th Company was expanded to form the 9th and 10th Companies. In May of the same year the two Dolmetscher Companies were transferred to Meissen and reorganised into an independent Nachrichten Dolmetscher Ersatz Abteilung of three companies. This rapid expansion was due to the heavy calls made on the depot for specially qualified personnel; it seems never, however, to have been able to meet the requirements of the numerous departments which it served and the Funkabwehr at least was always in difficulties through shortage of man-power.

3) The Intercept Companies

The only intercept companies of which we have reasonably accurate details as to composition and strength are the two Air Force Companies formed in 1942 to cover the Balkans. Each of these consisted initially of a small discrimination section (Auswertung), an intercept station of ten double bank positions (Uberwachungstelle), a long-range D/F platoon (Fernfeldzug and a short-range D/F platoon (Nahfeldzug). Each short-range D/F platoon contained five sections (Messtrupps) each of two D/F cars. Including administrative staff the total strength of each company was about 130 all ranks.

After the Italian capitulation, No.1 company became responsible for Italy while retaining part of its sphere of activity in the Balkans. This necessitated the creation of a new short-range D/F platoon and additions to the long-range intercept and D/F strength. Intercept stations were established at Recoara and Treviso where there was also a long-range D/F unit; the short-range D/F platoon was split into two squads, one being maintained at Rome until the evacuation, the other in the north in the Venice and Treviso areas. The units in Italy were directed operationally by Aussenstelle Italy of WNV/FU, which was established simultaneously, first at Rome, later at Verona; but they remained under command 1 Special Intercept Company headquarters at Belgrade.

While at Athens No.2 Coy established its main receiving station first at Phaleron, later at Ecali. Discrimination and technical direction of the company was centred here, though the actual headquarters were in the city for more convenient contact with Aussenstelle Athens and other C.E. and intercept agencies. One bank intercept posts were maintained at Jannina, Thebes, in the Morea and Crete and possibly Samos; the last named, though certainly projected, may never have been set up. The long-range D/F station was located at Lutsa, which seems to have been an important centre for all German Intercept services. In addition the company could call on a GAF D/F station at Kifissia, a naval station at Kalamaki and possibly others. In July, 1943, No.2 Company moved its headquarters and monitoring unit from Athens to Sofia, the long-range D/F station being established at Kavalla: a year later a further move was made to Bucharest. Throughout these moves the short-range D/F platoon of the company remained behind, first in the Athens and Salonika areas, and later moving back with the withdrawal of the German forces.

These Balkan companies underwent considerable changes of organisation which were not exactly paralleled in other areas. In September, 1944, both companies were withdrawn to Jueterbog and combined into a single new intercept company (Funkhorch Kp.) with a receiving station of twenty banks, discrimination section and long-range D/F network. The close-range D/F units were omitted from the new intercept company and were formed into a special D/F company to operate in Italy and the Balkans. This company was expanded to a strength of four platoons stationed respectively at Udine, Padua, Milan and Bratislava. The reorganisation of the Air Force Intercept Companies did not affect their subordination and operational direction. They remained under command of WNV/FU III and received operational directions from Funkuberwachungstabt II, the former Aussenleitstelle Sued-Ost, at Vienna, and from its subordinate Verbindungsorganen at Klagenfurt, Verona and Bratislava.

Knowledge of the size and movements of the intercept companies provided by the army is far less extensive. 612 and 616 Intercept Companies appear to have been similar in composition to those in the Balkans, but 612 Company at least was on a far larger scale. The main effort of this company

was concentrated on the eastern front with H.Q. at Cranz in East Prussia. It was responsible for the whole of the front except those areas of Poland and the central sectors which were covered by the Orpo. It contained at least four monitoring stations located at points stretching from the Baltic states to Constanza (later Bucharest) and it had an equivalent complement of long-range and mobile D/F platoons. Also nominally part of this company were a mobile D/F platoon at Bordeaux and an intercept station, long-range D/F unit and mobile close-range platoon based at Koge in Denmark. For all operational purposes, however, these units came under the Offizier für Funkabwehr West Europa and had little or no connection with their parent unit. The platoon at Bordeaux was directed by Aussenleitstelle Paris while the units in Denmark dealt direct with WNV/FU III at Berlin. An intercept station of four banks at Alta in Norway was originally staffed by 612 Company, but was taken over by the Orpo in the summer of 1942.

616 Company was on a smaller scale and was concentrated in France and Belgium. H.Q. and intercept station were originally located at Melun but moved later to Sermaise. One short-range D/F platoon of four Messtrupps was based on Paris, a second on Brussels. The unit at Brussels evacuated to the Hague in the winter of 1944; at the end of March 1945, it finally rejoined the company which had withdrawn to Uelsen. Further movements are unknown though it was the company commander's intention to reach WNV/FU headquarters.

615 Company appears to have been a special unit for the interception of VHF radio telephony, including ground to air contacts. The company operated in France, Belgium and Holland with a detachment in Norway and was comprised of an H.Q. at Chartrettes and ten mobile Trupps; each of these contained intercept and mobile D/F sections and was responsible for a spectrum extending from 30 to 300 megacycles. The unit used the covername Ursula. Its strength is not known. In connection with this interception of VHF a special discrimination section, known as Auswertung Ursula was attached to the Aussenleitstelle Paris. All material intercepted by units of 615 Company was handled by this unit. The Auswertung, which was composed of one officer and four N.C.O.s, as part of the Aussenleitstelle dealt with the local C.E. authorities in all matters dealing with VHF transmissions. Auswertung Ursula reached Paris in December 1943; previously its members had been at the Central Auswertung in Berlin where all material had been sent by 615 Company, but it is not clear at what date interception of VHF commenced. A fair amount of material was intercepted by 615 Company, but very little success was achieved in attempting to locate VHF transmitters, since the mobile D/F, without the help of long-range D/F bearings, was faced with an exceedingly difficult task.

The detachment of 615 Company in Norway was despatched in the summer of 1944 on a mission which was largely exploratory to determine whether VHF was in fact being used in that area as this was considered a possible indication of invasion intentions. The unit travelled up the coast by ship from Kristiansand to Hammersfest with a view to intercepting R/T transmissions from the shore to ships and submarines as well as aircraft. The main result of this operation was the interception of no more than normal air and naval traffic, though a few R/T transmissions directing supply dropping aircraft were apparently detected in the northern mountainous areas. No further action was undertaken against these stations in view of the technical difficulties and it seems to have been considered that R/T was not in fact largely used in Norway. During the last weeks of the war traffic instructions and VHF equipment of Swedish origin were discovered in Norway and an attempt was made to detect VHF

traffic between Sweden and Norway in order to verify suspicions to which this discovery had given rise. No success had been achieved by the time of the capitulation.

4. Orpo Units.

At the beginning of the war Beohachtungsstellen, or intercept stations of the Orpo were situated at Berlin-Spandau, Cologne, Constance, Vienna, Nuremberg and Oldenburg. These stations normally consisted of four banks though that at Berlin may have been somewhat larger. Long-range D/F stations already existed at Berlin (Diedersdorf) and Hamburg and stations at Constance and Vienna were completed at an early date. All these stations were administered by the local Orpo signals staffs but were directed operationally by the Radio Control Centre at Berlin. Few material changes took place in this organisation; the number of stations on Reich territory was not increased and there is no evidence that the existing stations were expanded to any large extent. Static long-range D/F stations at Brest and Tilsit were added to the main network after the occupation of these areas. The principal development was the establishment of new B-Stellen in certain of the occupied territories.

Whereas the OKW Intercept Companies came into being suddenly at more or less full strength the equivalent Orpo units developed gradually from small beginnings through the expansion of the newly developed B-Stellen in occupied areas. The final form of the Polizei Funkaufklärungskompanien did not, however, differ materially from that of the military units.

The final establishment of the police intercept company in Norway amounted to six officers and about 250 O.R.s of whom some twenty were women. These were divided between a headquarters and an intercept station of ten banks at Oslo, an intercept station of three banks at Drontheim and five mobile units, known as Operations Sections, each section consisting of seven or eight vans. These were based at Tromso, Drpntheim, Oslo, Bergen and Kristiansand. No. 5 Ops.Section at Kristiansand was staffed by OKW personnel. The headquarters in Oslo contained discrimination, plotting room and administrative staff. It was this H.Q. which finally became Funkmessstelle Nord. The company possessed no long-range D/F stations of its own, though the GAF station at Fornebu was staffed by Orpo personnel. In addition bearings were obtained from air force and naval stations at Jessheim, Stavanger, Bergen, Drontheim and Bardefoss. Although D/F stations in the Reich could be called upon, they appear to have been seldom used as the base line obtained was too short.

It is interesting to note that the development of the company in Norway showed a tendency to move from an initial concentration on pure interception towards the establishment of an extensive mobile D/F organisation based on only a small fixed intercept establishment. In Oct. 1940, when Oslo station consisted of four operating positions, small stations of two banks each were opened at Bergen, Stavanger and Kristiansand. These were closed in February 1942, the staff being withdrawn to Oslo. Shortly afterwards the intercept station of four banks at Alta, staffed by 612 Intercept Company was taken over by the Orpo, but was closed in March, 1943, as results had been negligible. A final experiment was made of setting up an intercept station at Kirkenes in 1943, but this too appears to have been short lived. In general it appears that results obtained from stations other than at Oslo were extremely poor, while the presence of the discrimination staff at

headquarters no doubt also made the concentration of intercept resources at Oslo desirable. As against these rapid changes in intercept organisation the first mobile unit was not complete and brought into operation until 1941 and by the end of 1942 there were no more than about ten trained mobile D/F operators in the country. Training was undertaken on a larger scale during 1943 and the Operations Sections in their final form began to be established at the end of the year. It was not, however, until the end of 1944 that the whole country was covered by available mobile units. Two sections were established at first, one, based on Tromso, to cover north Norway, and a second based on Oslo, with a detachment at Drontheim to operate in the south. After an unsuccessful experiment in mobile operations in Bergen the units concerned were withdrawn to Drontheim, where an independent section was established. Operations Sections 4 and 5 were despatched respectively to Bergen and Kristiansand only in October 1944. The Operations Sections were not themselves equipped with boats, but, through the medium of MNV/FU Aussenstelle Oslo, naval cutters were often borrowed when close-range bearings from the sea appeared to be desirable.

The company in Russia whose headquarters became Funkmessstelle Ost, was set up in Minsk in 1942. It consisted of two officers and about 110 O.R.s. It contained the usual administrative, communications and discrimination sections, a ten or twelve bank intercept station and a D/F section. The D/F section contained two portable long-range D/F sets, of which one was stationed at Miau (Lithuania) and the other at Lemburg in Poland, and also six close-range sections, fully staffed and equipped, but without vehicles. Since they were not available for mobile operations the personnel of these latter sections were in fact employed as operators and provided about ten additional positions to the strength of the intercept station.

Theoretically the function of this company was the interception, location and destruction of partisan W/T stations. Quite apart, however, from the fact that the company was not equipped with effective mobile units, partisan transmissions took place from inaccessible points strongly defended by the armed bands which they served. This rendered the company powerless to operate according to the normal methods. So serious and widespread was the partisan threat that the interception of partisan W/T communications became a priority task of the military Y service and the whole resources of the Kdr.der Nachrichten Aufklärung 6 were devoted to this task. The Police Company co-operated closely with this unit and in effect became simply a subordinate intercept and D/F station. Routine intercept reports and D/F results were passed daily to KNA 6, from whom commitments were, in fact, if not in theory, received.

Funkmessstelle Ost and its subordinate intercept company withdrew to Lipke in July, 1944, leaving the whole of its equipment to follow by rail. But the equipment could not be moved in time and was destroyed at Minsk. Re-equipping being by that date impossible, the company was disbanded at the end of August, 1944.

Information is less complete concerning the units controlled by Funkmessstelle West at Paris. Until 1943 they operated throughout the whole of Western Europe, thus covering the same area as the OKW intercept units. But even at this time there was in practice a rough geographical division of spheres, the Orpo paying particular attention to Holland and the Paris area while the OKW covered the remaining areas, though this division of labour was only partial and both authorities operated to some extent throughout the whole area. After the formal division of responsibility the Funkmessstelle was responsible for Holland and the southern

half of France, except for the area around Bordeaux covered by 612 Intercept Company. The interest of the Orpo in southern France had been established even before the occupation, by its direction of operation Donar.

The first Orpo units moved into Holland in the summer of 1940 when the headquarters were established at the Hague with an intercept station of four banks at Scheveningen. This was later expanded gradually to a maximum of probably ten banks. A close-range mobile unit Trupp was attached to the intercept station and a second was established at a later date at Groningen. The allocation of mobile units was centrally controlled by Funkmessstelle Paris with a result that cars were frequently moved from one station to the other or transferred to France. The strength of the Trupps in Holland consequently fluctuated; at times each might have seven or eight cars and at other times they might be reduced to a single car, though, if difficulties were experienced through a shortage of mobile units in Holland, additional cars were normally sent in from France. In 1943 the headquarters and the Scheveningen intercept station were transferred to Driebergen. In the autumn of 1944 the unit was moved to north Holland, but lost a large part of its equipment en route at Zwolle.

There is no definite evidence of the existence of an Orpo intercept station in France, though it would seem probable that at least one existed. The mobile unit strength is reported from several sources to have been considerable, but no detailed figures are available. These units were concentrated round Paris until the occupation of the formerly unoccupied zone when they were moved south and stationed in the principal towns of which Lyons, Marseilles and Toulouse are known to have contained Trupps.

Funkmessstelle West was not in direct control of any long-range D/F stations. The units in both France and Holland made use of the main Orpo D/F system in the Reich which included a station at Brest.

The central headquarters of all these units was originally an office in the Police Technical School at Berlin. The Orpo was responsible for its own recruiting, and training courses for all grades within the intercept service were constantly held at the Signals School. This also contained workshops and experimental laboratories which were responsible for testing and improving intercept equipment.

5. Subsidiary Sources: the Services, Amateurs.

The Funkabwehr did not neglect subsidiary sources of interception which might prove of value. A document, dated 3.11.44, dealing with security matters under various headings and distributed to all units of the fighting forces reads:-

"All reports regarding known or suspected secret transmitters, suspected radio cases and monitoring reports are to be passed without delay to the local Funkabwehr office for appreciation and transmission to OKW/AG/WNV/FU." (Translation).

The document gives the address and teleprint code name of WNV/FU III and goes on to state that such reports should include date, time, frequency, place of interception, type of traffic and arm of the service making the report. It ends with an exhortation to make such reports with the least possible delay.

This document appeared somewhat late in the day, but it is to be presumed that it was in fact a re-issue of information and instructions of long standing; it is unlikely that this obvious source of possible reports of illicit transmissions would have been neglected until the last few months of the war. There is no information to show how far service operators

actually provided any information of value to the Funkabwehr.

The extent to which wireless amateurs were made use of for Funkabwehr purposes is not very clear. Ogruf. Sachs, C.S.O. of the Waffen S.S. and president from 1941 to 1944 of the D.A.S.D. the German Amateur Radio Service, has stated that at the beginning of the war a number of members of the D.A.S.D. were recruited by Major Schmolinske of the Abwehr into an organisation known as the Kriegs Funk Verkehr for Abwehr work. Since it is known that the Abwehr employed a number of amateurs in its own signals network it may be assumed with some reason that these were in the main drawn from the KFV and that this body was in part at least a field for the recruitment of Abwehr wireless operators. At the same time Sachs states that at least one of its functions was to check on illicit transmitters and that after about a year it was in fact removed from the Abwehr and incorporated into the WNV/FU III. A few captured letters of 1941 and the early part of 1942 show that certain amateurs were at that time being asked by the D.A.S.D. to intercept suspect transmissions. Amateurs were also employed for other purposes by the OKW and some of them were issued with special war transmitting licences by the WNV/FU in order to carry these out.

It is tempting on the strength of these few facts to suggest the existence in Germany of a counterpart of the V.I. organisation of R.S.S. In point of fact, however, there is no evidence that it was either so extensive or long lived, nor that it played anything like the same role in dealing with highly important Top Secret material. The only transmissions which are known to have been passed to amateurs for interception were those using amateur type callsigns; while exact figures are lacking, it does not appear that more than a comparatively few members of the D.A.S.D., itself not a large body during the war, were employed for this purpose, and there is no mention at all by any source of amateurs being used in this capacity after 1942. In default of more definite evidence, therefore, it cannot be assumed that any more elaborate organisation existed than a few selected members of the D.A.S.D. who were asked by WNV/FU III, through the medium of their own society, to monitor suspect amateur transmissions. Even this, no doubt, provided useful material for the Funkabwehr, but the voluntary interceptor played no outstanding role among its sources. These arrangements may have continued throughout the war, or they may have petered out gradually as more and more members of the D.A.S.D. were either drafted into the services or wholly employed in other aspects of the German war effort.

6. Air Co-operation.

A squadron of Fieseler Storch aircraft fitted with close-range D/F and photographic equipment was placed under the control of WNV/FU III in 1942. The headquarters of the squadron was at Berlin and later Jueterbog, but the individual units, known as Kommandos were detached to peripheral points where they came under the operational control of the Aussenstellen. These Kommandos were intended to co-operate with the short-range D/F platoons, but they tended to be employed in areas where ground units were unable to operate by reason of either roadless country in mountainous areas or the presence of partisan units. The majority were therefore stationed on the Russian front and in the Balkans, where Kommandos were based at Belgrade, Sofia and Salonika. Later one Kommando was moved to Udine to cover north Italy but this rapidly ceased activity owing to Allied air superiority. After the German withdrawal the Balkan Kommandos

were concentrated at Klagenfurt, but both they and the unit in Italy were transferred to the eastern front in March, 1945. One unit was tried out at Fornebu in Norway for a short time and there may have been similar experiments in France.

Each Storch Kommando consisted of one aircraft fitted with two receivers, short-range D/F equipment and photographic apparatus. A ground wireless link was also installed. The D/F loop aerials were carried on the wing tips in a fixed position. Data regarding suspected illicit transmissions was passed to the Kommandos by the Aussenstellen or Intercept Coy. H.Q. in the same way as to a short-range D/F platoon. Once the ground wave of the signal was received the aircraft flew towards the apparent point of transmission taking photographs. It then turned off and repeated the process on a different course cutting the line of the first. The transmitting station was looked for on photographs taken at the point of intersection of the two courses. If the station was located by this means, in partisan held areas the information was passed to the GAF for a bombing target. When co-operating with the short-range D/F platoons the chief function of the Kommandos was the detection of the ground waves.

The Storch Kommandos were afflicted by the shortage of petrol and equipment and Allied air superiority which interferred with all German airborne activities after a certain point in the war. Apart from this, however, it does not appear that they achieved very much success. In normal country they were less effective than mobile units on the ground, while in mountainous areas they experienced difficulties due to atmospheric and geographical factors. Probably the special conditions of the eastern front, with its large scale partisan activities in flat country, were the only ones which rendered this method of operation of practical value. Some confirmation of this is provided by the posting of practically all the Kommandos to the Russian theatre in the last stages of the war.

7. Communications.

WNV/FU III was linked to all its Aussenstellen by teleprinter and similar communications were maintained between the two Aussenleitstellen and the subordinate Aussenstellen in their zones. The Orpo Funkmessleitstelle also had teleprinter connections with its subordinate Funkmessstellen, B-Stellen and D/F stations. In areas where the intercept units were static for long periods teleprinters were sometimes installed at lower levels; thus Drontheim intercept station had a teleprinter link to the H.Q. in Oslo and the intercept station and H.Q. of 616 Intercept Company was linked to Aussenleitstelle West.

To a large extent alternative W/T communication was installed to replace these teleprinter links in the later stages of the war when line communications became unreliable owing to Allied bombing. This had the added advantage that it enabled Aussenstellen and even the headquarters of WNV/FU III to communicate direct with the platoons and other subordinate units of the intercept companies. Teletype links were maintained between WNV/FU III and the Aussenstellen at Paris, Brussels, Lyon, Warsaw and possibly others. Within the intercept companies W/T was the normal means of communication, though it appears that WNV/FU III was better equipped in this respect than the Orpo units. Thus No. 2 GAF Special Intercept Company had W/T links between the main station at Ecali and each one of its subordinate one bank intercept stations, whereas several police units in the north of Norway had to rely entirely on the telephone for communication

with Oslo. All the mobile short-range D/F platoons were equipped with wireless, for intercommunication with the platoon. In most cases this was not employed except on training schemes; when on operations the telephone was normally used.

On all W/T links fixed callsigns appear to have been used, while procedure was that of the service, Army, Air Force or the Police, from which the units concerned had originated.

Where the organisation had no communications of its own, channels belonging to other services were employed. The first choice was inevitably those of the OKW if they existed since these were controlled by the WNV itself, but service, diplomatic and Abwehr communications were also used.

D. ACTIVITIES IN NEUTRAL COUNTRIES.

1. Spain.

The most important effort of the Funkabwehr on neutral territory was in Spain. It is not known at what date the first steps were taken to set up an intercept organisation on Spanish territory but this probably took place early in 1943; it was certainly in operation in the summer of that year at which time one source states that the total staff employed numbered twenty three. These were Wehrmacht personnel, but held diplomatic cover and worked in civilian clothes; equipment was taken in in Embassy baggage and operating was carried out in diplomatic or consular buildings.

The organisation in Madrid held the status of an Aussenstelle of WNV/FU. As such it dealt direct with WNV/FU I concerning administration and personnel, with FU II concerning equipment and with FU III in technical intercept matters. The chief of the Aussenstelle was locally subordinate to Oberstlt. von Rohrscheidt, the Leiter of Abwehr III in K.O.Spain. The operators employed were on the strength of the Aussenstelle. The unit was equipped with a D/F station and with a Trupp of close-range mobile units camouflaged in civilian cars which also carried snifters. The intercept strength at Madrid is unknown, but may have amounted to four or six banks and there was also a station, possibly consisting of not more than one bank at Barcelona.

The allocation of tasks to the unit was carried out in the normal way by Berlin. The station had an important general search commitment and was also used to monitor transmissions emanating from all points in south west Europe with particular attention being paid to the traffic of Allied agents in France and Spain working to North Africa or the U.K. The D/F station was particularly important in locating these agents since accurate results could not be ensured by Reich stations owing to the awkward position of Spain in relation to their base lines. In each case of an allied agent transmitting in Spain instructions were issued by Berlin as to whether mobile unit action was to be undertaken. The object of this procedure was to supply the German Foreign Office with evidence on which to approach the Spanish government with a view to obtaining the arrest or expulsion of the agents.

The most interesting aspect of these activities is the position of Aussenstelle Madrid in relation to the Spanish authorities. The Spanish C.E. and police services were not only aware of the presence of the Funkabwehr in Spain but rendered active assistance. There is no doubt that an extensive exchange of information took place: the Spanish co-operated closely with Abwehr III in the pursuit of agents and when W/T or cipher material was found as a result of raids this was

handed over to the Germans, while the latter though no doubt keeping a good deal of information to themselves, went so far as to hand over to Lt.Col. Juste and Lt.Col. Sarmiento actual decodes of messages which were of particular interest to them. On at least once occasion the Spanish C.E. staff requested the Funkabwehr to cover certain de Gaullist traffic and this request was complied with. Spanish republican traffic was another sphere in which the German unit assisted its hosts.

The final stage in co-operation was reached in the autumn of 1944 when discussions took place with the Spaniards with a view to setting up a combined intercept station. On the Spanish side it was agreed that six well trained pro-German operators and two sets should be provided. This was welcomed by the staff of the Aussenstelle who intended to employ the Spanish operators on known commitments thus releasing German personnel to increase general search cover. The sanction of Berlin was asked for this arrangement but it is not known certainly whether this was granted.

2. Turkey.

A Funkabwehr organisation existed in Turkey on similar lines to that in Spain though it was in every respect on a less impressive scale. It appears to have been set up about July, 1943, and its purpose was the interception of traffic in south eastern Europe and particularly links going into Turkey itself. There was an establishment of probably four banks at Ankara which came under the direct control of Berlin and operated under diplomatic cover, but did not have the status of an Aussenstelle.

Axis relations with Turkey being very different from those with Spain, the Funkabwehr did not receive assistance from the Turkish authorities and had to operate with great circumspection. There is no indication that the unit possessed either D/F or mobile unit equipment, and the setting up of a special mobile unit mission in Turkey suggests that this in fact was not the case.

For obvious reasons Turkey was of particular interest to No. 2 GAF Special Intercept Company, whose sphere of responsibility was the southern and eastern Balkans, and during 1943 two special operations were organised by this unit on Turkish soil. A number of Allied agent stations having been found by D/F to be in Turkey, an N.C.O. was smuggled in in the early summer with portable close-range D/F and snifter apparatus. His function was to endeavour to pinpoint a number of these stations and the mission lasted about two months. The second operation was started in September, 1943, when three N.C.O. operators were sent under commercial cover and by arrangement with the Abwehr, to establish an intercept post in Istanbul. They worked for some months as a detached intercept station under the direct operational control of the Company headquarters at Sofia.

3. Operation Donar.

Operation Donar took place in the unoccupied zone of France in August 1942. The presence of a number of Allied W/T agents in this area being known as a result of D/F operations, the German government obtained the formal consent of the Vichy administration to the despatch of a mobile unit expedition to close them down. The operation was directed by the Sipo and the technical equipment and personnel was provided by the Orpo Funkabwehrdienst command in Paris, though there

are unconfirmed reports that a small number of OKW Trupps took part. The expedition was on a fairly large scale; all the Orpo mobile units in France took part and some were also withdrawn temporarily from Holland for this purpose. These were divided into a number of separate groups each of which was accompanied by a small Sipo and in some cases also by an Abwehr III detachment. Each group operated in a different area and in this way the whole of unoccupied France was covered.

The organisation and particularly the cover arrangements of the expedition appear to have been extremely faulty. Few French-speaking personnel took part and the steps taken to preserve secrecy were very ineffective. Consequently results were probably smaller than would otherwise have been the case and certainly did not come up to the expectation of the promoters of the operation. At the same time it is reported that about six clandestine stations were located and closed down. The expedition was recalled just before the German entry into the unoccupied zone.

E. OPERATIONAL METHODS

1. Interception

There does not appear to have been any material difference between the operating methods employed by the WNV/FU III and those employed by the Orpo; while there was little contact between the two organisations in the field, the experience of each tended to be acquired by the other means of contact between the respective headquarters. Unless otherwise specifically stated, this and the following sections may therefore be considered to apply to both organisations.

Like that of R.S.S., the work of the Funkabwehr was based on general search of the ether and subsequent monitoring of all signals which could not be immediately identified as either harmless or known and already covered. The aim was to maintain one quarter of all intercept resources on general search and this figure was fairly rigidly adhered to at least during the first half of the war; thus the allocation of a station of four banks at that time was invariably three banks for commitments, and one bank for search. The later increase in the volume of commitments, which was not compensated by an equivalent increase in resources, probably took up a certain proportion of the banks previously allotted to search; of the twenty banks of the Funkhorch Kompanie at Jueterbog no more than two were on search at the end of 1944: but this loss of sets permanently allotted to search was partially made good by the supplementary general search carried out by operators monitoring commitments in the intervals between the schedule times of the transmissions covered.

In theory search bands of 100 kilocycles were employed and were centrally allotted to units by the headquarters in Berlin in such a way as to ensure complete cover of the whole spectrum. The paucity of receivers, however, made the general use of such narrow bands impractical, while a centrally administered overall cover of the spectrum did not make sufficient allowance for the local search needs of such widely spaced areas as France, Norway and the Balkans. In practice, therefore, the width of search bands varied considerably from 100 kilocycles upwards and a certain amount of freedom was exercised by local commanders as to the frequencies covered. The effect of this was to make a more elastic and probably more efficient system of general search with most

resources concentrated on the busiest bands.

Considerable responsibility was laid on the general search operators for recognising and ignoring the unwanted signal. As far as possible he was assisted by the issue by the discrimination sections of schedules and callsign lists, but in the main the operator relied on his knowledge of the procedure and operating characteristics of different organisations. Conversely the operator also knew the characteristics of groups of transmissions which were being followed as commitments and tended to search for new unknown signals of these types. To a certain extent a loophole was thus created and there is one recorded case of a transmission from Oslo continuing for a whole year without being reported by any station of the Funkabwehr although the intercept station at Oslo was in the ground wave of the transmitter; this transmission used procedure which was unlike that of the usual clandestine groups covered and so was ignored by the general search operators.

New clandestine signals of wanted types were if possible covered by general search operators until they were either identified by the discrimination sections or allotted as new commitments. As a general rule it was the control station of new links which were heard first on general search and it then became the duty of the operator to search for the answering signal: one estimate has been given that as a very rough average a period of about two weeks elapsed between the first interception of a new control signal and the interception of the answering station.

Double-banking with split headphones was the normal practice for both general search and commitments (i.e. each operator handles two receivers, the output from both being fed into a single pair of headphones; one receiver is used to intercept the control, the other the answering signal). It is not known at exactly what date double-banking was first introduced, but it was probably during the summer of 1941: it was the general practice in the Orpo intercept units by the autumn of that year. A tendency towards specialisation among operators covering commitments also arose early. Each link was normally covered at all times by the same bank, while each bank was allotted links belonging to the same group and therefore using similar operating procedure. So far as the inevitable casualties, promotions and transfers allowed, each operator was retained permanently on the same commitments and so he became something of a specialist.

Intercept stations were normally on a small scale and averaged from four to ten banks. The station of twenty banks at Jueterbog established in the autumn of 1944 by the Funkhorch Company of the combined 1 and 2 Special Intercept Companies is the largest of which a definite record exists. The establishment of small listening posts of one or two banks was widespread but it was only in No.2 Special Intercept Company that the practice was a regular policy; this Company split up its intercept resources in this way both when in Greece and after its removal northwards to Sofia.

Each operator was responsible for reporting required signals for D/F purposes. Operators copied all traffic and logged all procedure and chat sent by the intercept stations. Logs and traffic were then passed to the local discrimination section.

2. Discrimination.

Discrimination consisted of the analysis of results submitted by all operational units, the allocation of commitments to them and liaison with the relevant cryptographic and C.E. sections. This work was carried out at three levels.

Within the operational units themselves commitments were allocated to individual operators and a rapid pre-discrimination of logs was carried out to extract QRX's and similar information requiring immediate action at the station. Normally, however, the logs were then passed to the relevant Aussenstelle or Funkmessstelle where more thorough analysis was carried out. The Aussenstellen generally carried the main responsibility for discrimination and allocation of all transmissions taking place within their areas, though very complete details of all the results of their discrimination, including essential details of every item recorded was passed by the Aussenstellen to the central Auswertung at WNV/FU III. This normally took the form of a daily report sent by teleprint or telegram covering the latest activity of regular commitments, new transmissions discovered and believed to be connected with local commitments and general search. A written report covering all activity was rendered monthly by each Aussenstelle. The central Auswertung kept central records of all transmissions and undertook the more difficult semi-cryptographic work of cracking callsign systems and coded QRX's and procedure: it was also responsible for the analysis of all general search reports and for the overall allocation of commitments to different units. A special sub-section handled all D/F results and carried out central allocation of tasks to the D/F network.

This system invariably led to a fair amount of duplication since detailed records were kept at headquarters, at Aussenstellen and in the discrimination sections of the intercept units themselves. At the same time the system did not differ greatly from that employed by R.S.S. and its overseas units, and in view of the wide extent and varying local conditions of the German organisation it is not possible to say that a more rigidly centralised system would have been more effective. The amount of discrimination done at each level varied considerably in accordance with local circumstances and particularly with the existence of rapid and reliable communications between the Aussenstellen and the operational units. Thus the station at Bucharest of No.612 Company carried out more or less complete discrimination on the spot, passing its results and receiving its commitments direct to and from WNV/FU III; telegrams and reports passing between the two were repeated for information to the headquarters of the Company at Cranz, but the latter played but a small part in controlling the work of its subordinate unit. In other cases, in order to avoid delay, reports were sent by intercept units simultaneously to both the Aussenstelle and the central Auswertung. In 1944 the units in Italy sent all discrimination signals simultaneously to WNV/FU III at Jueterbog, to Funkuberwachungsabt II at Vienna and to the headquarters of No.1 Special (GAF) Intercept Company at Belgrade.

General search reports were analysed by the central Auswertung first from the point of view of procedure in order to eliminate unwanted transmissions. Those of wanted types were then compared with schedules and daily callsign lists of known transmissions in order to segregate previously unknown items. These were passed out as new commitments as soon as sufficient data was available to initiate a regular watch. All W/T channels covered as commitments were known as 'lines' (linie = R.S.S. 'service') to each of which was allotted a separate number of four or five figures. Different blocks of numbers were allotted to the different 'nets' (netz = R.S.S.Group) or distinct groups covered. This numbering of commitments was rigidly centralised at headquarters.

It should be noted that the nets covered by the Funkabwehr were distinguished on geographical basis rather than one of procedure as has been the normal custom of R.S.S.

For instance, the transmissions of S.O.E. and of Section VIII were classed together in a single net despite all differences of procedure. Seven principal nets were covered:-

1. The Western or LCA net. All links from the U.K. to France, Belgium, Holland, Norway and Denmark.

2. The MBM net. All links between the U.K. and Czechoslovakia.

3. The PS net. All links between the U.K. and Poland.

4. The ZZZ net. All links between the U.K. and the Iberian peninsular.

5. The South Eastern or Balkan net. All links controlled from the Middle East.

6. The Algiers net. All links controlled from Algiers.

7. The Eastern or WNA net. All links working to controls in Russia.

The three letter groups by which the majority of the nets were generally known were usually the callsigns of the first links identified in each. A card-index record was maintained, usually both locally and at the centre, of the activity, schedule and procedure characteristics of each line covered.

Allocation was carried out on the basis that normally intercept units were responsible for monitoring transmissions in their own areas. Thus transmissions picked up on general search by one unit would often be passed as commitments to other units while the first station would be instructed to dropcover. At the same time this was not rigidly adhered to when skip distance or other factors rendered more flexible allocation desirable, and most intercept stations were allotted some lines from several nets. Double cover was a general but not universal rule. Except in the case of Spain when both stations of a service were identified as being outside German occupied territory or the immediate front line zone cover was in most cases dropped unless the cipher used was one that could be read.

The Auswertung of WNV/FU III, in conjunction with Referat Vauck, produced a monthly report on its current activities, under the title of VN (Verslachliche Nachrichten). This contained detailed information concerning operational work in hand and the detection and capture of W/T agents as well as cryptographic information and copies of deciphered texts. About seventy copies were produced and in spite of its high security grading its publication appears to have aroused considerable misgivings on the grounds that it was a danger to security since it was distributed to comparatively low levels in the Funkabwehr and the C.E.Services.

3. Cryptography.

Initially all traffic was passed by intercept units and Aussenstellen to WNV/FU III at Berlin. There it was finally identified and registered, W/T discriminants were extracted, and, after the establishment of Referat 12 of In/7/VI, it was passed to that department. Owing to their close proximity in adjacent buildings, co-operation between the two sections was close; Referat Vauck received all

relevant W/T information which might be of cryptographic use from WNV/FU III, and in turn assisted it in breaking call-sign and coded procedure systems. All deciphered traffic was passed back to WNV/Fu III, which forwarded information of operational importance, usually in the form of the complete decoded texts, to the appropriate Aussenstellen. All captured documents dealing with agent ciphers were received by Referat Vauck, though even at this stage the Aussenstellen and intercept units when they captured an agent with his cipher instructions, worked locally on any traffic they had on hand before forwarding all the material to headquarters.

After the end of 1942, when members of Referat Vauck were attached first to Paris, and later to the other Aussenstellen, all traffic which could be read was handled locally, copies of the decodes being sent to Berlin. Traffic which was not read continued to be sent as before to headquarters and was not officially dealt with at the Aussenstellen though some of the attached cryptographers worked on copies of such messages on their own initiative. As soon as a new link became readable detailed instructions were sent to the appropriate Aussenstellen. This cryptographic devolution to the Aussenstellen was undertaken at the request of WNV/FU III in order to avoid the otherwise inevitable delay in the receipt of the contents of deciphered messages at the Aussenstellen where local operational action might be called for. The new system undoubtedly achieved this object and it was also of value in that cryptographic experts were then available to examine on the spot the cipher material of captured agents. At the same time it must be presumed that the dispersal of expert staff away from Berlin weakened the attack of the Referat on unread traffic. No cryptographic staff was sent to Aussenstelle Madrid and decodes of local operational importance continued throughout to be sent from Berlin by bag or signal.

The staff of Referat Vauck numbered about 35, of whom between a half and two thirds were normally allotted to the eastern section, since throughout the greater part of the war this was considered to be the most important. After the attachments to Aussenstellen began there were seldom more than 15 to 20 members at Berlin at any one time.

4. <u>D/F</u>.

Control of the D/F system was fairly rigidly controlled by the D/F control and plotting section in the central Auswertung headquarters, but the system seems on the whole to have been somewhat cumbersome.

Only in the Orpo D/F network were the stations linked by line to a central control so that signals intercepted in the home B-Stellen could be put to line and simultaneous bearings obtained on the same signal. A similar system existed on a smaller scale in Norway where the Oslo intercept station was able to put signals to line to the D/F stations at Fornebu and Jessheim. The signals thus transmitted to the D/F stations were passed through loud speakers and the split headphone system was not employed. Where line communication between intercept and D/F stations was impractical the Orpo companies installed W/T links; Fornebu station had links to all other stations which worked for the Orpo Company in Norway, and the intercept station at Minsk had links to its own D/F stations. In the latter case the W/T operators worked actually in the set room so that at least some direct contact was possible between intercept and D/F operators. These arrangements gave to the Orpo the great advantage that the expert intercept operators could report the activity of the stations wanted for D/F direct to the D/F operators

whenever the required signal came up, thus avoiding waste of time on the part of the D/F stations.

The OKW D/F service was less well equipped with communications and except whereas at Treviso they happened to be located at the same site there was no direct contact between the intercept and D/F stations. As an exception to this the D/F station at Lutza had a direct telephone line to the set room at Ecali. In all other cases the D/F stations had to work on their own, receiving with their assignments sufficient data to enable them to pick up the required station without assistance from the intercept operators.

D/F assignments were sent out by WNV/FU III through the appropriate Aussenstellen or intercept company headquarters which usually had as a standing task the provision of bearings on their own local commitments. Bearings were returned from the D/F stations by the same route. This procedure made it impossible to ensure simultaneous bearings and also rendered the issuing of assignments a rather complicated process. At the same time it was possible to use only the D/F stations in certain areas if this was sufficient. The Aussenstellen and intercept companies issued their own assignments to the D/F stations under their control though these had a lower priority than requirements coming from Berlin: such assignments mostly consisted of items found locally on general search and believed to be connected with the commitments covered by the station concerned.

The use of D/F stations belonging to other services was a feature of all sections of the Funkabwehr. Assignments for these were passed by WNV/FU III through the appropriate signals authorities, but in local areas such as Norway and Greece arrangements were usually made between the commanders on the spot to ensure the greatest possible co-operation and efficiency and in such cases requests to the other services were usually issued by the Aussenstellen direct to the stations concerned.

Plotting was carried out centrally in Berlin. The Orpo Funkmessleitstelle had its own D/F control and plotting office which issued assignments to the Orpo units and plotted their results, but this worked in reasonably close conjunction with WNV/FU III plotting office, which was able to allot tasks to the other organisation. Funkmessstelle Ost, since it was dealing with material of local military importance passed their bearings to KNA 6 from whom they also received their D/F assignments. In outlying areas both the OKW and the Orpo units plotted their own bearings and in appropriate cases made use of them to initiate mobile unit action. It is not believed that statistical methods of plotting were introduced. In co-operation with the local Abwehr III stations Aussenstellen sometimes also arranged for the playing back of captured agents simply in order to be able to D/F the control Stations.

5. <u>Mobile Units</u>.

The initiation of mobile unit action normally rested with the Aussenstellen and Funkmessstellen which maintained close contact regarding potential cases with both Berlin and the local C.E. units. In important cases, such as any believed to be connected with the Rote Kapelle organisation, Berlin exercised close supervision and operations were carefully prepared in advance before the mobile units were brought into action. On the other hand all units down to mobile unit crews were entitled to take independent action even to the extent of arrests in emergencies though such action was likely to bring forth strong objections on the part of the Sipo.

Once the mobile units were set in motion the Trupps proceeded independently to attempt to locate the suspect transmitter, though if possible the appropriate headquarters unit would be kept in constant touch with the progress of operations and they in turn would keep the C.E. authorities informed. Where the units were operating a long distance away from their headquarter stations they would normally maintain direct contact with C.E. or Abwehr III officials in the areas concerned. If the operation was successful plans were made during the final stages for concerted action, which might extend to the calling out of large Gestapo or Wehrmacht units with a view to cordoning off and searching whole areas. Reports on the progress of all mobile units operations were sent daily to Berlin by Aussenstellen and other units, occasionally even by close-range D/F platoons themselves.

If possible up to three cars were employed on any one case but for various reasons it was frequently not possible to use more than one. In such cases once the ground wave had been discovered bearings would be taken from two different points and the car then proceed to the point of intersection and recommence the process. It was the practice in several units to carry two sets in the car, one fixed, the other portable which could be used on the ground to obtain cross bearings against the set in the car. The famous 'guertel' snifter was not produced until early 1943 and was a product of the police technical college at Berlin-Spandau; as a result the Orpo units were greatly favoured as to both the speed and quantity of supply, but by the end of the year it was in general use throughout OKW units as well. Its use greatly facilitated the final stages of successful operations, which previously had seldom in built up areas been able to proceed beyond the indication of a particular block of houses.

Some successes were undoubtedly achieved by the German close-range D/F units, but it is extremely difficult to arrive at any exact estimate of the number of cases in which transmitters were located wholly are mainly by technical means, since widely differing figures are given by different sources. Thus an Amt.IV, R.S.H.A., officer from Italy has stated that the Funkabwehr did not succeed in locating a single agent in Italy, whereas a former member of the Zemke close-range D/F platoon of No.2 Special Intercept Company has affirmed that at least six were caught by that unit in north Italy: a member of Aussenstelle Athens gives six as the number located in Greece, while a member of No.1 Special Intercept Company gives the same number as fourteen. In general it appears that the Funkabwehr was not highly thought of by most members of other agencies who in any case tend to overemphasise the value of their own units and methods, while unit pride causes some members of the Funkabwehr itself to exaggerate the number of successes achieved. It is quite certain that failure was complete in a very large number of the cases undertaken, and where success or partial success was achieved it was frequently weeks or even months before a transmitter was at all precisely located.

Members of the Funkabwehr under interrogation have been at pains to account for and excuse the relative ineffectiveness of their mobile unit work. The reasons put forward fall into two categories; failures on the part of the organisation which could have been rectified, and genuine technical difficulties. Among the first it is claimed that the Funkabwehr suffered from lack of equipment and technical training. This was probably true during the early years of the war as it is certainly the case that the close-range D/F work did not really get into its stride until towards the end of 1943. Oberstlt. Giskes of Abwehr III has stated that about twelve agents were caught by the Funk-

-abwehr in Holland and Belgium, and most of these cases occurred during late 1943 and 1944, though a few successes were achieved from the end of 1941 onwards. The mobile unit organisation in Norway was also late in becoming effective and sources from this area who quote cases of successful operations refer for the most part to the last two years of the war. It is probably true that difficulties in obtaining equipment were met with, but at the same time there is no doubt that a large number of reasonably well equipped mobile units were in fact available at least during the second half of the war. In any case shortage of equipment does not explain failure to make effective use of those units which did exist. This raises the question of training and it seems possible that there was always a shortage of really fully trained mobile unit operators through too frequent changes of function and posting. Even so it is known that quite a number of men were continuously employed on these duties and that all mobile units, when not on operations, were employed on exercises which appear to have been well thought out and not to have avoided difficulties.

Other reasons for failure which are put forward are faulty security and failure of the long-range D/F organisation to provide sufficiently accurate fixes. The validity of the latter is difficult to estimate but there are a number of recorded cases in which the mobile units were totally unable to locate the ground wave of a transmitter and it is probable that this is due to the inadequacy of the long-range D/F and plotting service. Security measures were organised locally according to circumstances. In Norway the Orpo units wore army uniform and used army trucks, but in most areas civilian clothes and various different makes of civilian cars were employed. It is thought that in Greece the Opel cars of the Funkabwehr quickly became generally known and recognised and the same thing may have occurred in other areas. Operations generally took place amidst a hostile population so that security precautions should have been very strict and it is quite probable that a number of leakages took place.

The technical difficulties adduced were partly local conditions met with in certain areas such as Norway and other more general technical factors. The latter were often introduced into the training curricula of Abwehr and S.D. agents after consultation with the Funkabwehr and they were believed to be made use of by Allied W/T agents. D/F equipment was found to be inaccurate when handling frequencies above 12000 kilocycles or when near large stretches of water or electrical installations such as transformers and also at night and during periods of full moon. It was found that Allied agents became increasingly well trained in making use of these technical factors and also in imposing additional artificial difficulties. Among these the most important were considered to be frequent changes of location, short transmissions and the use of lookouts and previously reconnoitred escape routes.

These difficulties were for the most part genuine and unavoidable and would in any case have been met with. But there also appears to have been a consciousness of failure over and above the purely technical factors amongst the personnel of the Funkabwehr. Its record in mobile unit work was in fact not unimpressive and there were undoubtedly some successful operations in all areas in which it functioned, although it is probable that the number of complete or partial failuresgreatly exceeded them.

6. Playbacks.

. The Funkabwehr played an important role in the running of W/T double crosses. In some cases more or less complete supervision of the case rested with the appropriate Funkabwehr unit, in others it was simply called in an advisory capacity with regard to technical aspects of the case. In all cases the Funkabwehr had to be informed of the initiation of a double cross, whether this was being run by the Sipo or by the Abwehr, and it had to be furnished with full particulars of W/T schedules. In most cases these would already be in its possession, since one of its officers was usually called in after the arrest of a W/T agent to carry out a technical interrogation. In at least one instance, however, the provision of full particulars did not prevent the Funkabwehr from locating and arresting an agent who was being run by Abwehr III as an unconscious double cross.

The initiation of double crosses was a matter for the Sipo or Abwehr, though where initiation rested on technical factors, such as the repair of a set, the local units of the Funkabwehr naturally played a vital role. In some cases they asked for a playback to be undertaken for their own purposes such as D/F bearings.

The Funkabwehr was never primarily concerned with the intelligence aspects of double crosses though where co-operation with the C.E. service was good, officers of the Aussenstellen were often more or less fully in the picture. Generally speaking the Funkabwehr units supervised the technical W/T aspects of such cases and where Referat Vauck cryptographers were available at the Aussenstellen these handled the cipher details. In the Nordpol case in Holland the Orpo unit was entirely responsible for transmission and enciphering although there were no cryptographers available. Messages in clear were received from Sonderfuehrer Huntemann of Abwehr III but the actual working of the agents concerned was handled by the Orpo. This case, in fact, appears to be one where co-operation between the Orpo intercept unit and the local Abwehr III unit was outstandingly successful. A very similar use was made of the WNV/FU III units in France by Abwehr III in running their double crosses, though the actual extent of supervision by the Funkabwehr varied considerably from case to case. Some difficulties arose here after February 1944, owing to an order by WNV/FU III headquarters that double agents who were not actually under arrest were not to be accepted for double cross purposes by its subordinate units. In most cases the Sipo placed less reliance than did the Abwehr on assistance from Funkabwehr units. The playbacks run by Sonderkommando Pannwitz were always carried out in close conjunction with the Funkabwehr, particularly from the cryptographic angle, but the whole of the Rote Kapelle case was exceptional in that all the C.E. authorities were concerned up to the highest level.

F. CONCLUSION.

There were certain activities of the Funkabwehr which were not parallelled in R.S.S. Its air co-operation squadron for close-range D/F work was not a success though it may have proved useful in the particular conditions of the eastern front and was occasionally able to render assistance to the ground units in locating the ground waves. The interception and location of VHF transmitters undertaken by No. 615 Intercept Company was a task which R.S.S. was never called upon to carry out. It met with some success in VHF

interception but was quite unable to locate the transmitters concerned. The penetration of the Funkabwehr into neutral countries was an imaginative undertaking which clearly produced results of value, but this development was the result of political decisions above the level of an intercept organisation itself and was in fact no more than the geographical extension of the ordinary activities of the Funkabwehr. Finally the Funkabwehr played a far larger part than did R.S.S. in the organisation of wireless double crosses.

Numerically the Funkabwehr was a larger organisation than R.S.S. In intercept resources its advantage was perhaps not very great; the total number of receivers manned probably did not very greatly exceed those of R.S.S., though they were more widely dispersed in smaller units; if the very large contribution of the V.I.s to the English organisation is taken into consideration the resources of the two were probably not very different. The Funkabwehr had more D/F stations of its own quite apart from the extensive use made of the D/F units of other interception services. It had many times the number of mobile units. These relative figures for different types of equipment reflect the differences of function between the two organisations to which attention was drawn at the beginning of this report.

In so far as they carried out similar functions the detailed technique of the two organisations was very similar. The main effort of the Funkabwehr was carried out by the eight mobile intercept companies which were roughly equivalent to the overseas units of R.S.S., the only equivalent of the latter's home establishment being the B-Stellen and D/F stations of the Orpo. It should also be noted that a large number of different makes and types of equipment were used by the Funkabwehr as opposed to the large amount of standardisation obtaining in R.S.S. This was at least partly the result of a general shortage of equipment and there can be little doubt that R.S.S. was by far the better served of the two organisations in this respect. A further important difference was to be found in the large measure of decentralisation on to the Aussenstellen of the Funkabwehr of the responsibility of discrimination and allocation, accompanied at a later date by a similar devolution of cryptographic effort. This was largely forced on the Funkabwehr by circumstances and except in the cryptographic field was probably not much greater than the equivalent devolution by R.S.S. onto its overseas units. In both cases the central headquarters received complete details of all work undertaken and retained control over discrimination and allocation.

Methods of interception and discrimination used by the Funkabwehr were fundamentally similar to those of R.S.S. and while there are reasons for believing that the latter was the more effective organisation, there is no doubt that the German C.E. services were provided with reasonably complete and well analysed interception of Allied agent transmissions. In D/F technique the centralised system of R.S.S., its developed and universal method of putting signals to line and the final introduction of statistical plotting gave it advantages which were not shared by the Funkabwehr, despite the favourable geographical situation of the latter in choosing sites for D/F stations. In mobile unit work there again appears to have been little difference of technique although in the Guertel snifter the Germans possessed an extremely effective instrument. It remains true that the number of successes in this field achieved by R.S.S. was relatively greater than those of the Funkabwehr despite the for more extensive experience of the latter organisation.

Comparisons between the Funkabwehr and R.S.S. largely favour R.S.S., but that does not necessarily imply that the Funkabwehr was not an effective wireless security service. In both cases the technique was gradually evolved from small beginnings and immense developments took place during the course of the war. The personnel of the Funkabwehr were on the whole hard working and enthusiastic, more so perhaps than in some other German services; their morale suffered only where they were neglected and despised by those with whom they should have co-operated. As with most German intelligence agencies the Funkabwehr suffered from serious rivalries and jealousies both internally through the co-existence of the WNV/FU III and the Orpo Funkabwehrdienst and externally in contact with Abwehr III and Amt. IV of the R.S.H.A. The extent of these rivalries at any given time or place was a rough measure as to the relative effectiveness of the Funkabwehr for, since a wireless security service is a technical instrument in the hands of the high command of the C.E. service, its efficiency depends on the extent to which it is effectively used as such. Thus where local C.E. agencies had little contact with or confidence in the Funk-abwehr, as in Italy or Norway, it proved relatively ineffec-tive, while in other areas, such as France, Holland or Greece, where reasonably close contact was maintained, its contribution was far larger. In such cases its effectiveness cannot be measured simply in terms of agents captured by technical means. The constant flow of information as to the dimensions, approximate locations and developments of Allied clandestine W/T networks was of real value to the C.E. authorities quite apart from additional assistance from deciphered texts and the direction of double crosses. In this light, and taking into account the difficulties which it faced, it may be concluded that the Funkabwehr provided a reasonably efficient service without at the same time being responsible for any startling technical developments.

DIAGRAM SHOWING STATUS OF THE WNV/FU/III

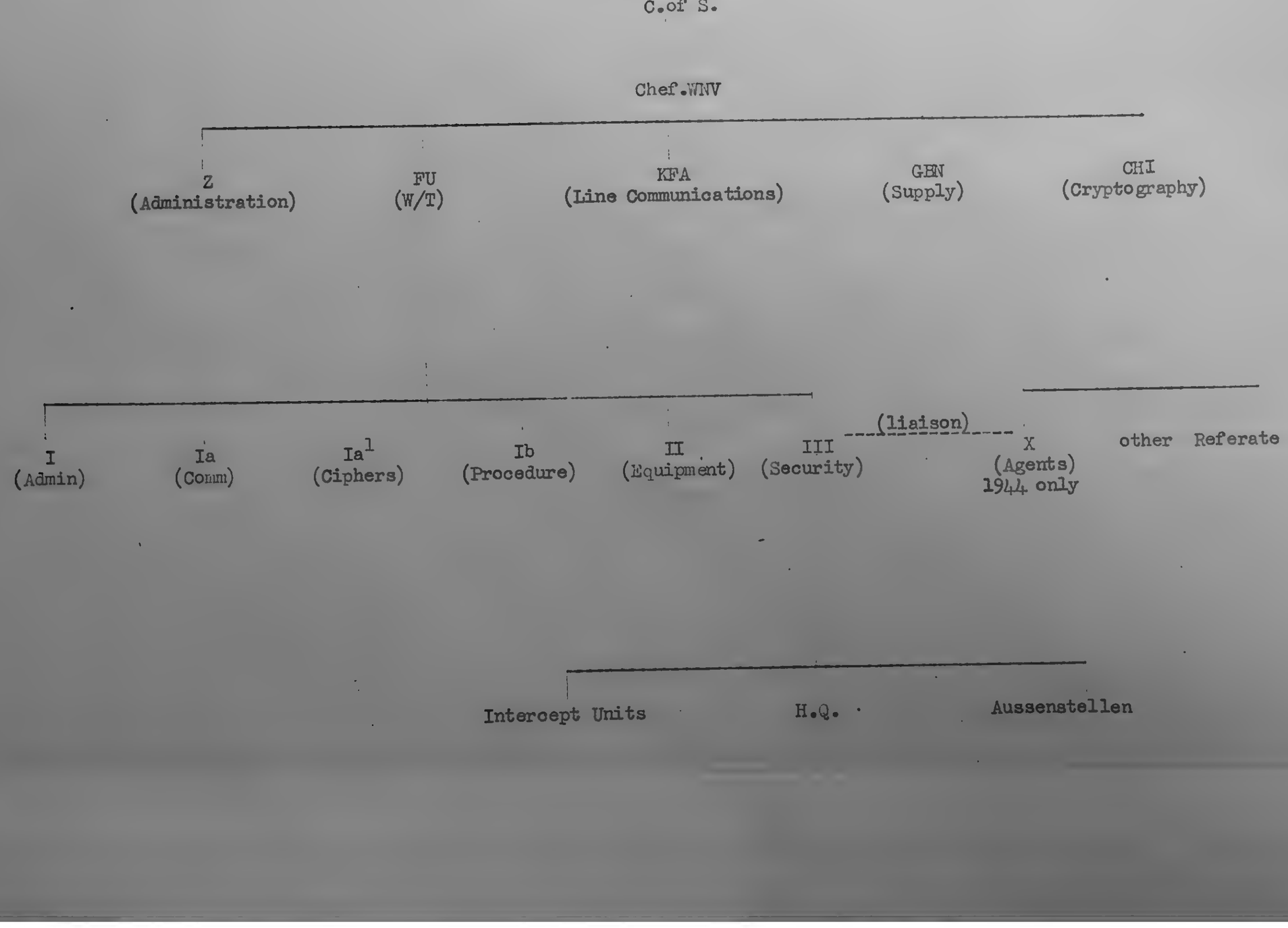


DIAGRAM OF ORGANISATION AND LIAISON OF WNV/FU/III

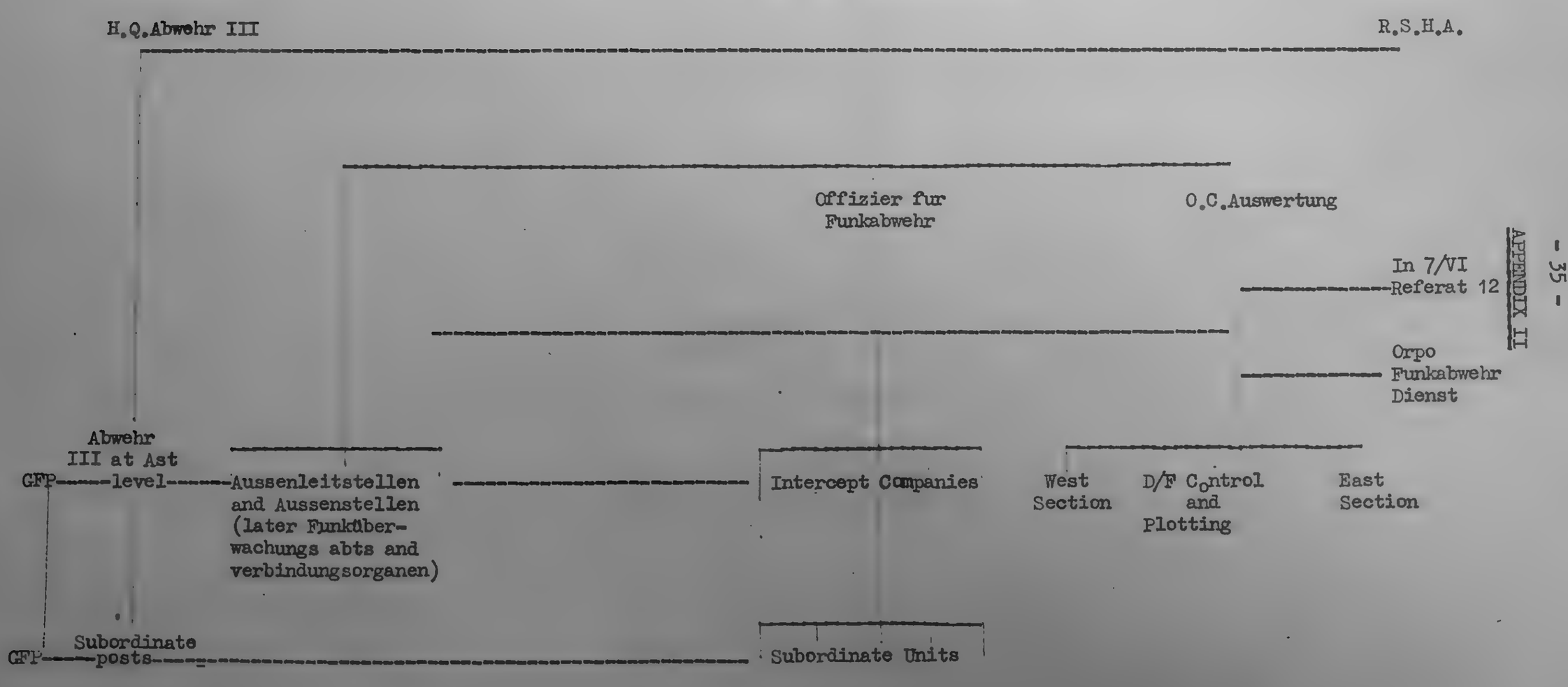
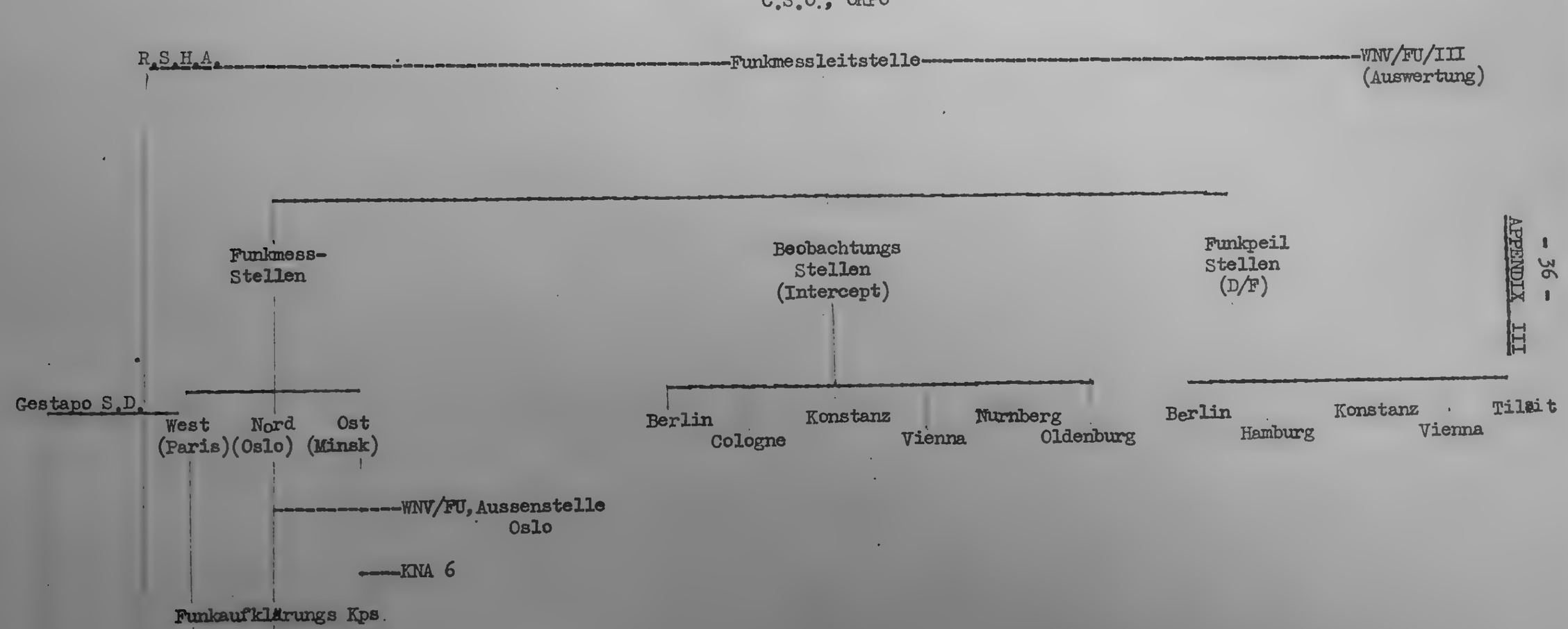


DIAGRAM OF ORGANISATION AND LIAISON OF ORPO FUNKABWEHRDIENST



APPENDIX IV

ADDRESSES

H.Q. WNV/FU III	14 Matthaikirchplatz, Berlin
In.7/VI, Referat 12	4 Matthaikirchplatz, Berlin
Aussenleitstelle West	64 Boulevard Suchet, Autenil
Aussenleitstelle Brussels	10 Av. de la Petite Espinette, Uccle, Brussels
	86 Av.Bel Air (billet)
	10 Av.de Hougemont (billet)
Aussenstelle Athens	48(?58) Patission, Athens
H.Q.NO.2 Special Int.Coy.	55 Kiffissia, Athens.
Funkmessstelle Nord	15 Holmsvei, Besserud, Oslo
3 Ops. Section, Norway	Majortuen School, Oslo
4 Ops. Section, Norway	5 Birkrveien, Bergen

APPENDIX V

COVER NAMES

Bienenkorb	WNV/FU, used by Aussenstelle Madrid (Bienenkorb III = WNV/FU III).
Rose	Funkstelle Berlin of WNV/FU. Used by BALKAN stations as add.for WNV/FU (Rose = WNV/FU III).
Tourist	Aussenstelle Madrid.
Morus	O.C. Aussenstelle Madrid to January, 1945
Dietrich	" " " from " "
Wotan	Major von Bary
Caesar	Hptm. Freyer.
Orest	Oblt. Lorentzen.
Uhn	Funküberwachungs Kp.616.
Ursula	Funküberwachungs Kp.615
Schwalbe	" " "
Aida	Aussenleitstelle West.
Lerche	4 Pl.of Funküberwachungs Kp.612, Constanza.
Winzer	No.2 Special Intercept Coy.
Schubert	Ecali Station of No.2 Special Intercept Coy.
Spezie	Thebes " " " " " "
Komponist	Lt.Col.Sarmiento
Manolete	Lt.Col.Juste
WFAN	Teleprint code name, WNV/FU III.

APPENDIX VI

PERSONNEL

OKW/WFST/WNV

Chef.	Thiele, General	Also Chef OKH/HNW
	Fellgiebel, General	" " " succ. Thiele
	Praun, General.	" " " succ. Fellgiebel.

WNV/FU

Chef.	Bayer, Oberst.	Till summer, 1942
	Burtscher, Oberst.	1942 - autumn 1944
	Rosenkranz	1944 - 1945

WNV/FU III

Gruppenleiter	von Bary, Major	Kdr.der Funküberwachung.
Headquarters	von Wedel, Major	Offizier fur Funkabwehr West and deputy to von Bary.
	Preusch, Oblt.	Assistant to von Wedel till 1943.
	Lorentzen, Oblt.	June - October, 1943.
	Kupinger, Lt.	Technical W/T officer
	Stuebing, Oblt.	" " "
	Schwarz, Uffz.	
	Macht, O/Fw.	
Auswertung	Schneider, Major	? O.C.
	Prigge, Hptm.	O.C. West Section.
	Wert, Lt.	West Section.
	Ruther, Fw.	" "
	Wollny, Lt.	East Section to 1942. Later in KNA 4.

Aussenleitstelle West.

von Wedel, Major	O.C. to 1942
Lorentzen, Hptm.	" 1942 - June, 1943
Freyer, Hptm.	" June, 1943 - Aug.1944.
Haubach, Major.	" from Aug.1944.
Buch, Oblt.	L.O.with Abw.Leitstelle III West. Oct.1944) Jan.1945.
Dietz, Oblt.	L.O. with Abw.Leitstelle III West. from Jan.1945.
Stratenschulte,Insp.	W/T expert. To Sept.1944
Fischer, Oblt.	Adjutant.
Siebert, Lt.	From Oct.1943.
Zank, Insp.	
Flamme, Fw.	
Granze, Uffz.	
Helmrichs, Fw.	
Verbuent, Grf.	W/T operator
Jung, Uffz.	" "
Offermans, Grf.	
Peters, Uffz.	
Rolfs, Uffz.	
Franz, O/Fw.	Discrimination.
Vesely, O/grf.	"
Render, St/Lilferin.	Clerk.
Engels, O/grf.	Driver.
Wernerus, grf.	
Ziegler, Uffz.	
Weigel, grf.	
Paguet, Wm.	
Arzt, Lt.	O.C. Auswertung Ursula.

Fink, St/Fw.	Auswertung Ursula.
Wiegemann, O/Fu.	" "
Faeser, Uffz.	" "

Aussenstelle Belgium.

Aschenbrenner, Insp.	O.C. to Oct.1943
Lorentzen, Oblt.	O.C. Oct.1943 - 1944.
Falter, Fw.	Interpreter.
Esser, Funkmaat.	W/T operator. From Jul.1944
Braun, O/gef.	Clerk.
Peters, Uffz.	
Suchanek, O/Fw.	
Wallner, Uffz.	
Jutensohn, Uffz.	
Helmerich, Uffz.	
Schwarzenbacher.	Guard.

Aussenstelle Sud-Frankreich.

Preusch, Oblt.	O.C. 1943 - 1944.
Haubach, Hptm.	O.C. 1944 till Aug.
Buecher, Krim/kom	Administration
Engels, O/gef.	Driver.

Aussenstelle Oslo.

Hensel, Oblt.	O.C.
Lorentzen, Hptm.	O.C. 1945.
Bachmann, Insp.	
Stratenschulte, Insp.	from Sept. 1944.

Aussenstelle Italy.

Aschenbrenner, Insp	from Oct.1943.
Lorentzen, Oblt.	O.C. 1944-1945.
Buchheim, Dr. Hptm.	to Sept. 1944.
Paplham, Oblt.	
Preusch, Oblt.	from 1944.
Jutensohn, Uffz.	

Aussenstelle Warsaw.

Haubach, Hptm.	O.C. to 1944
Buch, Oblt.	

Aussenleitstelle Sud-Ost, Vienna.

Bauer, Hptm.	O.C.
Hundt, Oblt.	
Schellер, O/Insp.	

Aussenstelle Varna.

Enzeleit, Oblt.	O.C. to Dec.1943.

Aussenstelle Madrid

Enzeleit, Oblt.	O.C. Mar. - Nov.1944
Giese, Oblt.	O.C. from Nov.1944.
Hollaender, O/Fm.	
Gerstung, Hptm.	
Bauer, Uffz.	Discrimination.
Wolter, O/gef.	Clerk.
Redtenbacher, Uffz.	
Frank, O/gef.	W/T operator.
Gastel, Uffz.	"
Gastner, O/gef.	"
Kaeten, O/gef.	Driver.
Orlamuender	
Hagen	
Richard	
Gettmann	
Haendler	
Bueger	

Funküberwachungs Kp.616

Tasche, Oblt.	O.C. to Aug.1944.
Kiel, Oblt.	O.C. from Aug.1944.
Seibert, Lt.	To Oct.1943.
Ert, Lt.	O.C. M.U.Pl. Brussels
Schneider, Uffz.	i/c M.U.Trupp, Brussels.
Metzler, Uffz.	" " "
Sperscheider, Fw.	" " "
Saurbier, Fw.	" " "
Franz, O/Fw.	" " "
Hauss, Fw.	" " "
Ebener, Fw.	" " "
Lagranche, Gef.	
Jung, Uffz.	
Weigel, Gef.	From Oct.1943, Interpreter
Heeg, Wm.	
Fischer, Fw.	
Debuke, Uffz.	Interpreter.
Helmrichs, Fw.	

Funküberwachungs Kp.615.

Kelch, Oblt.	O.C.
Wallner, Uffz.	
Roesner, Wm.	Amsterdam Trupp.
Feucht, Wm.	" "
Burghoff, Gef.	" "

Funküberwachungs Kp.612.

Kiel, Oblt.	O.C. M.U.Pl. Bordeaux.
Plog, Lt.	O.C. M.U.Pl. Koege.
Rohrborn, Uffz.	

No.1 Special G.A.F. Intercept Coy.

Weilbach, Hptm.	O.C.
Zemke, Oblt.	O.C. M.U.Pl. Milan.
Schmunk, Lt.	O.C. M.U.Pl. Padua.
Knaup, Uffz.	
Scherpe, O/gef.	

No.2 Special G.A.F. Intercept Coy.

Pitz, Oblt.	O.C.
Stern, Oblt.	O.C. succ. Pitz.
Schiels, Oblt.	O.C. succ. Stern.
Bauer, Oblt.	
Arnim, O/Insp.	
Herzog, Insp.	Technical W/T officer.
Stubbe, Lt.	O.C. M.U.Pl.
Bobsin, O/gef.	Operator.
Bochniken, O/gef.	"
Falkenstein, Uffz.	"
Franke, Fw.	"
Golnig, O/gef.	"
Haschek, Uffz.	"
Jaeger, O/gef.	M.U. operator.
Michael. O/gef.	" "
Richter, O/gef.	" "
Keim, Uffz.	Operator.
Schwarze, O/gef.	D/F operator.
Demski, O/gef.	" "
Kleinert, O/gef.	Italian interpreter.
Buerger, Uffz.	
Neuberger, O/gef.	M.U. op. Mission to Turkey
Zirke, O/gef.	Intercept post, Istanbul
Kuriava, O/gef.	" " "
Blasa, O/gef.	" " "
Kurowski, gef.	Operator.
Herz, O/gef.	"

Orpo Funkmessleitstelle, Berlin.

Fischer, Major d.S.	O.C.
Henningsen, Major d.S.	2 i/c
Wiegand, Hptm. d.S.	
Fechner, Major d.S.	O.C.Polizeinachrichteschule 1939.
Andree, Hptm.d.S.	Till 1940
Hagen, Hptm.d.S.	O.C.Experimental Station.
Fuchs, Lt.d.S.	Technical W/T expert, Inventor of Guertel D/F set.

Funkmessstelle West.

Schneider, Hptm. d.S.	
Vatteroth, Lt.	
Wellstein, M.d.S.	M.U. op. Operation Donar.
Holstein, M.d.S.	" "
Muller, M.d.S.	
Heinrich, Lt.d.S.	O.C. Intercept Holland to Dec. 1942.
Lienhard, Oblt.d.S.	" Intercept Holland from Dec. 1942.
Arndt, M.d.S.	
Ludwichowsky, M.d.S.	Operator. Driebergen.
Hoeffer, O/Wm.d.S.	" "
Kammengiesser, O/Wm.d.S.	" "
Kirchke, M.d.S.	" "
Kloss, O/Wm.	" "
Zopp, M.d.S.	" "
Keller, M.d.S.	" "
Piehl, O/Wm. G.	" "
Piehl, O/Wm. A.	M.U. Trupp, Diebergen.
Lust, M.d.S.	" " "
Rudolf, O/Wm.	" " "
Andree, Hptm.d.S.	O.C. M.U.Trupp, Groningen.
Muller, M.d.S.	M.U.Trupp, Groningen.

Funkmessstelle Ost.

Krumweide, Hptm.d.S.	O.C.
Weisz, Lt.d.S.	O.C. Intercept Station.
Leonard, M.d.S.	i/c Communications.
Gaum, M.d.S.	Administration.
Lust, M.d.S.	From Oct.1943.

Funkmessstelle Nord.

Andree, Hptm.d.S.	O.C. 1940 - 1943.
Horn, Hptm.d.S.	O.C. succ: Andree.
Vatteroth, Hptm.d.S.	O.C. succ: Horn.
Krumweide, Hptm.d.S.	O.C.July 1944 - Jan.1945.
Schildt, Hptm.d.S.	O.C. from Jan.1945.
Hambrink, Lt.d.S.	O.C. Intercept Station.
Nowodny, Dr.	Discrimination.
Baumann, Wm.	"
Eisel, M.d.S.	"
Lang, O/Wm.	Administration.
Hockauf, M.d.S.	Operator.
Grachegg, M.d.S.	"
Friedmann, M.d.S.	i/c Alta Intercept.
Amman, Lt.d.S.	O/C. Drontheim Intercept.
Mann, Lt.d.S.	O.C. No. 1 Ops. Section.
Wittgen, Lt.d.S.	O.C. No. 2 Ops. Section.
Holstein, Lt.d.S.	O.C. No. 3 Ops. Section.
Lust, Lt.d.S.	O.C. No. 4 Ops. Section.
Luda, Lt.	O.C. No. 5 Ops. Section.
Siebler, M.d.S.	No.4 Ops.Section operator.
Heidler, M.d.S.	" " "
Wohl. M.d.S.	" " "
Nothvogel, M.d.S.	" " "
Kaul, M.d.S.	" " "
Ulbrich, M.d.S.	" " driver.
Kern, M.d.S.	" " "
Frobel, M.d.S.	" " "
Schellenberger	" " "

IN/7/VI.

Mettig, Major	O.C. to July, 1943.
Lechner, Major	O.C. from July, 1943.

Referat 12.

Vauck, Oblt.Dr.	O.C.
Koehler, Fw.	2 i/c
Miersemann, Uffz.	West Section.
Bernert, O/gef.	" "
Faber, Fw.	" "
Kalisch, Gef.Dr.	" "
Kurfess, Gef.	" " Sonderkdo. Pannwitz.
Lenz, Fw.	" " Sonderkdo. Pannwitz.
Linz, Uffz	" "
Meyer, O/Fw.	" "
Offen, Uffz.	" "
Richter, Uffz.	" "
Pichler, Fw.	" "
Bernhard, Uffz.	" "
Taaks, Uffz.	" "
Verosta, Uffz.	" "
Zimmermann, Uffz.	" "
Bittner, Gef.	East Section.
Rossival, Uffz.	" "

Baer, Uffz.	East Section
Keller, Uffz.	" "
Kuehn, Insp.	i/c Recruiting.
Gay, Gef.	
Gurth, civ.	
Hanbricht, Gef.	
Heyer, Insp.	
Lohse, Uffz. P.	
Lohse, Uffz. W.	
Semmel, Gef.	Schultze-Boysen case.
Traxl, Fw.	executed in connection with
Heymann, O/Fu.	" " "

APPENDIX VII

EQUIPMENT

Equipment was not standardised in the Funkabwehr nor in its component units. The following are the principal types used:

Intercept Receivers

Telefunken	KW - E.a.		(1 - 10Mc/s)
"	Horchempfaenger	'c'	(3500 - 25000 Kc/s)
"	"	'd'	(25000 - 46000 Kc/s)
"	"	E.52	(GAF receiver)
"	Torn E.b		(90 - 7095 Kc/s)
Korting	Horchempfaenger		(an imitation of the American HRO).
Eltz-Radion	"	R1.	(long and medium wave)
"	"	R2 and R5.	
Philipps	"		
Lehmkühl	"		

Long-range D/F

Telefunken	Funkpeilempfaenger	C-Adcock	(to 16 Mc/s)
Lorenz	"	Adcock	(to 10 Mc/s)

Ground-wave D/F

Kapsch NFP a/c. (of French origin. 25 cm loop aerial. Frequency range 4000 - 7000 Kc/s).

Snifter.

Gürtel Kleinpeiler für Bodenwelle. (designed by Lt.der Schupo Fuchs of the Polizei Nachrichtenschule, Berlin, and subsequently manufactured by Lorenz. The set has dimensions of 30 x 15 x 3 cms and is designed to be fixed to a belt worn by the operator. A supporting strap worn round the neck provides the D/F loop aerial. Minimum signal strength is obtained when the operator is facing the transmitter.)